

RE-DESIGNING A CURRICULUM THAT VALUES A WORK-INTEGRATED APPROACH TO STUDENT LEARNING

Chester KM To
Karen Ka-leung Moon
Paulene Hsia
Sek-foo Chan
Ka-fai Choi
Lai-kuen Chan
Priscilla Chan
Roberta Kwan
Alice Chu
Jimmy Chang

The Hong Kong Polytechnic University
tctokm@inet.polyu.edu.hk

ABSTRACT

Technology-based business and management programs have long been challenged in the aspects of teaching and equipping students with analytical thinking skills to handling real life problems. These problems are not simply because of fast-paced technology changes, but also stemmed from today's complex globalizing business activities that concern multi-disciplinary knowledge of engineering, innovation and business. In view of these intractable complexities, most university undergraduate programs cannot help but expanding tremendously the scopes of theories, knowledge and skills. However, the teaching and learning methods are still characterized by what is so-called surface learning skill that students are simply required to recall pieces of theory or even surface understanding to handle assessment requirements. Students feel much difficult and abstract to applying concepts from a variety of management and technology disciplines into real life practices. This paper discusses the issues in the pedagogy and program design in technology-based management programs and posits that an effective learning and re-use of knowledge in dynamic contexts can be enhanced using a work-integrated curriculum design approach. The authors illustrate a case of the use of work-integrated pedagogical method and present a framework guiding the process of the pedagogy development. At last, the authors conclude with a discussion of the validity of the approach and the effectiveness.

INTRODUCTION

In 2003, a team of Institute of Textiles and Clothing at The Hong Kong Polytechnic University conducted a project to review and re-design the curriculum contents of a bachelor level textile science and management program. This was in response to a demand from industries for development of students with higher problem analytic and solving competence and confidence to cope with challenging real life business requirements. Conventional teaching and learning methods are much characterized by what is so-called surface learning skill that students are simply required to recall pieces of theory or even surface understanding to handle assessment requirement. Very often, students feel much difficult and abstract to applying the textbook ideas and concepts into real life practice. The review and re-design project therefore aimed in incorporating the curriculum of academic program into professional contexts, especially of the textiles and apparel marketing and merchandising, on the basis of work-integrated approach. The main pedagogical approach was to place students in the real world setting of the product design and globalizing supply businesses and encourage them to learn and to think critically with a multi-disciplinary and hands-on problem-solving approach.

The team emphasized three fundamental issues in developing such a vitalizing program: first, the identification of the emerging knowledge in the marketing and merchandising that competitively sustain advantages in today's global business activities; second, the facets to the problems that impede effective planning and monitoring global merchandising activities; and third, the strategic use of non-formal training that provides students with value-added learning opportunity, eventually leading to measurable learning outcomes during the course of

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undergraduate educational process. In the years, the program has been redesigned and developed into a professional-oriented curriculum that rigorously integrates workplace learning into a number of academic disciplines including technological management, product development and marketing, and global supply operations and logistic management.

The issues on designing marketing and merchandising curricula in professional contexts

Traditional pedagogy of textile marketing and merchandising is mainly based on a comprehension of different sorts of managerial knowledge and concepts, which are much theoretically generalized in nature. The scope of knowledge largely involves the methodological anticipation of textile and apparel demand in global marketplaces, theoretic and pragmatic concepts of textiles and apparel product development, managerial control of sourcing and buying process, facilitation of finance creation and transfer, and supervision of production and transportation. In recent years, with the impacts of globalizing activities and innovation in technology, marketing and merchandising functions have undergone a series of radical changes (Abernathy et al., 2000, 2004; Berger & Lester, 1997).

To appreciate the significance, consider the changes in the marketing and merchandising process and practices. A decade ago typical operations in Hong Kong apparel merchandising companies were mainly conducted by groups of merchandising staff who individually focused themselves on particular apparel product categories, like men's shirts, ladies' blouses, etc. Upon receipt of international buyers' advice about overseas market requirements, they started to translate the requirements into materials and production specifications, place orders to factories, and follow up manufacturing and transportation processes. The duties of merchandising staff were very local and technology-oriented. However, such operations are now very vulnerable, facing the challenge of supply process globalization. When developing and producing global-oriented textiles and apparel products, merchandising companies have to conceive all the variable factors, like market potential, cross-country manufacturability, international legal and financing aspects, logistics and so on, throughout all phases of a product life cycle.

In today's globalization environment, engineering and business activities are highly integrated, emphasizing a high level of process and communication consistency among dispersed, but interdependent functional teams and organizations (Kotabe, 1998; Kogut, 1985; Porter, 1986). At the outset of each business cycle, international textile and apparel companies, such as Liz Claiborne, Laura Ashley, GAP, C&A, etc have to consolidate individual regional demand quantities into a single production and distribution budget for each season's product collection (Abernathy et al., 2004; Hollis, 1996). Their worldwide affiliated buying

offices then coordinate the dedicated sourcing and procurement processes for the different collection items and allocate them various production sites. Keeping close liaison with suppliers, these companies establish sorts of supplier contractual commitments and develop exclusive products that allow advantageous costs and delivery terms. J.C. Penny, Benetton and those companies stressing trend-oriented product development, use flexible information coordination systems to develop and adjust different product portfolios for different regional needs. Today's globally integrated operations in the textile and apparel supply markets are deemed as one of the essential inputs for competitive performance. Yet to comprehend and map out the whole landscape of such knowledge within a curriculum structure implies an inherent problem of complex knowledge identification and integration, spanning across manufacturing process and materials planning, product development and innovation management, international marketing, organization and human science. In such case, the curriculum design absolutely relies on how much experience the curriculum designers have and how the contextual aspects can be perceived within the global business systems. In this project the team attempted to develop a novel, systematic approach to structure vitally the body of teaching and learning contents and to deliver a corresponding logistic system under restrained resources and time frames, which we shall discuss in detail in the later sections.

The second issue with which the project team revealed concerned was the requirement to enhance students' analytic skills and creativity that helped to resolve problems of planning and monitoring project-based organizational functions. From the point of organization design views, staff in marketing and merchandising companies are placed in a matrix structure, wherein the responsibility of each of the staff is bilateral, built on two command lines stemmed from the vertical departmentalized function duties and the horizontal task-based assignments. See the Figure 1.

That's to say that, merchandising staff should be very knowledgeable to interact with different functional teams and to coordinate jobs cross-disciplinarily; the tasks include negotiating offshore sourcing and supply contracts, harmonizing product specification and transportation across different countries, and handling day-to-day responses to a variety of enquiries from the interacting functional teams. The greater is the extent to which the activities are globalized, the more complex are the dispersed merchandising and marketing tasks to be orchestrated and the more analytic resources and competence are required to cope with the tasks. Students in textile and apparel marketing and merchandising were now seriously confronted in the limitation of conventional learning frameworks that were commonly unable to incorporate with analytical thinking skills into handling cross-disciplinary problems.

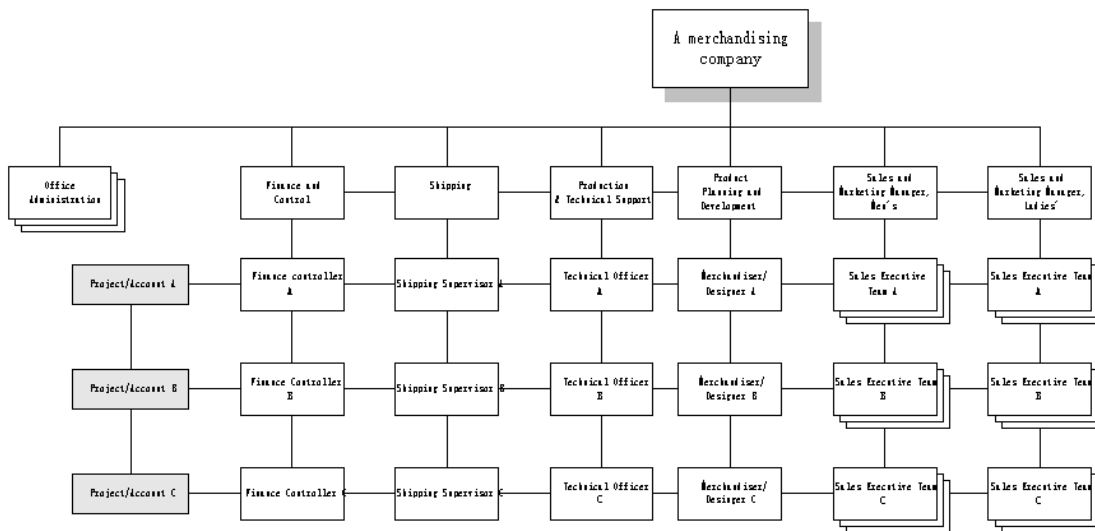


Figure 1: A Matrix-based Merchandising Responsibilities

At last, the most critical issue in the curriculum design was how to respond to the educational requirements put forth by the government officials that expected students capable to attain higher level of learning outcomes in terms of hands-on professional knowledge and skills, and the all-roundness qualities such as creativity, self-confidence, commitments, global horizon, etc which were not easily implemented within the classroom environment. The project team therefore took into consideration the merits of non-formal workplace learning at the bachelor level educational studies. Theoretically viewed, non-formal education has implied the notion for what was referred to as out of school education, at least in the past. It is based on the self and intrinsic motivation of the learner and, generally the individual learning achievements are not judged or assessed (Eraut, 1994; Hartley, 2000). Non-formal education is non-hierarchically structured in nature. It has highly differentiated formats in terms of time, location, numbers and composition of participants and training teams, the dimensions of learning and the application of its results. The concepts can be much related to recurrent and continuous learning, and are about acknowledging the importance of learning and education which take place outside recognized teaching institutions (Heinemann & Wilson, 1995; Stoelinga, 1990). It is also widely debated that non-formal workplace education systems are more adaptable to the socio-economic changes (Rubenson, 2000). Therefore we argue that a more systematic approach of curriculum structuring of such non-formal training can make leverage and scale up the learning performance in the use of practical, experiential knowledge; in the meantime, non-

formal learners can savor the excitement of emerging knowledge which in return encourages them to pursue more advanced learning by learner-centered means, like research studies.

LEARNING PROCESS INTEGRATED WITH NON-FORMAL WORKPLACE TRAINING

Non-formal education is often mixed up with informal education, which is somewhat unavoidable, because the two concepts have some common grounds (Schön, 1983; CQDG, 2001). In informal learning, an individual experience enriches personal development that takes place throughout all cycles of life and in peer relations, within the family, through the media and other factors of influence in the lives of people. However, there is no curricular responsibility. No institutionalized body stands behind the learning that takes place about values, content, good practice or social qualification. There is no comparable learning standard; there is no structure and no evaluation. However, non-formal education provides all these elements. This is also a type of structured educational opportunities that encompass theoretic knowledge and standards; the validity and the effectiveness of which can be evaluated through scientific analysis methods.

Simkins (1977) compared and contrasted non-formal education programs with formal ones and gave rise to an ideal-type analytic framework for education curriculum design. See the Table 1.

Table 1: Ideal-type Analytic Framework of normal and non-formal Education (Simkins, 1977):

	Non-formal	Formal
Purposes	Short-term & Specific; likely non-credential-based.	Long-term & Generalizing; mostly credential-based.
Timing	Short cycle; recurrent.	Long cycle; preparatory.
Content	Individualized and outcome-oriented; More hands-on.	Standardized; Input-centric academic achievements.
Logistics	Environment-based, socio-economic linked; Flexible; Learner-centered.	Institution-based, tending isolated from society short term requirements; Structured; Teacher-centered and resource intensive.
Control	Self-governing and motivated	External

In this curriculum review and re-design project, non-formal workplace education and training is the dominant learning feature. In addition, we emphasized a variety of methodological learning possibilities:

- intercultural learning inputs, which include overseas placement;
- leadership and organizational management mainly within Hong Kong and China Mainland settings;
- substantive experiential learning in the textile and apparel related companies;
- participation of industry practitioners and senior executives in developing what personal qualities of university graduates they expect;
- future technology and environment awareness.

Idiosyncratically viewed, the work-integrated non-formal learning is much like as problem-driven learning process that everybody uses from the start of life. In essence, the learning process is situational and students are self-directed (Finch, 1999; Ludvigsson, 1999). During the course of training at workplaces, the marketing and merchandising students took a higher level of commitments to their learning in the placements, which were in majority job-performance oriented, aiming at coping with real life operational tasks or problems in textile and apparel businesses. Very often, the students had to tackle with contingent problems, reach consensus with a lot of interacting parties, and make decisions by discretionary means. Through real life actions, they review their learning outcomes and progress experientially.

On such premises, the curriculum design team developed a methodological and pedagogical framework to shape the work-integrated curriculum and to facilitate the corresponding deliveries. Strategically the curriculum should comprise the contemporary knowledge and hands-on experience together to meet the future workforce requirements. Furthermore, such the unifying pedagogical framework supported and encouraged multi-disciplinary integration and collaborations between educational milieus and professional societies. Let's discuss the framework in the next section.

OBSERVED ISSUES ON PROCESS AND LOGISTICS OF NON-FORMAL LEARNING IN WORKPLACE

At the beginning, groups of students were given placement opportunities in companies and the superordinates in workplace acted as mentors purporting to give immediate guidance and direction to students. The students were required to formulate the underlying learning purposes and measurable goals expected, the potential problems they would encounter, both in the areas of technical and human aspects, and any relevance that is perceived useful to understand and resolve the problems encountered during the workplace training. During the course of the workplace learning, they were encouraged to comprehend and analyze the task problems and to suggest solutions with reference to the knowledge concepts learnt in campus. Evidently, the students were observed to be more committed to the performance in the workplaces, and took the initiation and ownership about the learning progress and results. Through the process of applying concepts into practices and the evaluation of mistakes and the respective solutions, learning outcomes could be more substantially attained and valued. In other words, the students held the total ownership of knowledge acquisition, reasoning, and restructuring. Such type of work task driven experiential learning engaged students in the deepest level of thinking and demanded the highest level of use of their intelligence (Ludvigsson, 1999). Simultaneously, the students could be trained with types of human skills, like team management and cooperation, resolving conflicts, the skill of opinion interchange, the self-assessment, and so on.

However, non-formal workplace learning did not guarantee perfect merits in every pedagogical aspect. In various workplace environments, students were required to exercise their personal judgment and adapt to different work tasks. Learning tended to be loosely structured and the students were unable to take the initiative throughout all phases of learning. Students often squandered time and effort on tackling routine duties and tasks assigned, or

neglected the unstructured, but relevant, information in the all phases of workplace learning. Learning was inclined to be vulnerable or drawing pre-mature conclusion. The students easily lost confidence in facing real life problems, especially in the professional contexts that much emphasize the practitioners exercising personal judgment and professional intuition. As such, the effectiveness of learning was much determined by how and what duties were assigned, what types of and how large the responsibilities were carried in the work. In the phases of the curriculum design and review, it was revealed much concern about such issues and a lot of questions related to the methods or mechanisms, through which the essential learning objectives had to be directed and appropriate for the globalizing marketing and merchandising workforce requirements. Some questions were very philosophical (e.g. what were the stakeholders, where did the students, companies and university gain benefits, and what were the purposes of the learning contents, both in terms of academic and social requirements?) and some concerned logistical ones (e.g. how long was the workplace training necessary to let students attain the adequate training outcomes, how frequent was the training evaluated and to what extent, or was it still necessary to assess students through conventional examination systems or the participating companies' appraisal methods?) So the curriculum design team proposed a framework to consolidate the issue questions holistically and visualize the structure and interdependence between the components of the non-formal workplace learning and the classroom-based knowledge contents of the textile and apparel technology based management program.

A PEDAGOGICAL FRAMEWORK

As mentioned, during the period that the program curriculum was written and reviewed, the team raised a lot of questions concerning the formulation of the non-formal workplace learning components and the logistics issues outside the university. How the issues were prioritized and to what extent the issues were taken in consideration to develop student competence in this cross-discipline program became very crucial. Furthermore, the team was also required to specify the background requirements of potential placements such that the eligible students could be categorized for types of the workplace learning, says, in the international textile and apparel buying companies, surveying and quality auditing houses, manufacturing plants, etc. The curriculum design team also examined if the jobs and duties, from which the learning were nurtured and extended, were relevant and adequate in terms of the mastery of the expected technology knowledge, the support for additional professional knowledge built, the knowledge concurrence and the capability for critical and creative thinking. Listing the sets of the interrelated questions showed a great extent of the complexities of re-designing the curriculum. To describe the whole contexts of designing the complex cross-discipline technology and business

program, a concept decomposition (affinity) map was built using the questions arisen (Martin and Ishii, 1998; Dawson, 2004). The map that illustrated different levels of enquiry detail was used to find the underlying structure and relationships of ill-structured and dynamic knowledge contents and the non-formal workplace curriculum requirements. The process for building the decomposition map consisted of taking the response to a set of questions and grouping them into highly coherent clusters. Using the logical flow of influence and dependence amongst the clusters of the question issues, a process-based analytic model was built, whereby the curriculum development processes were planned and analyzed on a monolithic basis. See the Figure 2.

In brief, the individual pedagogical issues of the decomposition mapping framework consist of two enquiry levels, namely philosophical and logistical enquiries. Philosophical enquiry refers to a first level of articulation of the study context, within which the learning objectives, targeted students and mediating learning methods are essentially defined or examined for the work-integrated bachelor degree level program. Correspondingly the logistical enquiry refers to the sets of consideration of matching implementation supports, most of which are related to the resources to be allowed for teaching staff, the assessment and review requirements, the likely forms of mentoring or pastoral care, the possible constraints like the types and relevance of jobs and duties available for a class of students, the formalities for establishing the agreements (perhaps the liabilities) with the industry practitioners, etc. This decomposition map is indeed not a simple cause-and-effect model, but a web of teaching and learning experiences, teacher-students '360-degree' interactions, an inventory of a wide variety of restructured knowledge concepts using real life experience. Analyzing the map, we see the differences of the work-integrated non-formal learning concepts from the typical institutional learning approach that uses bell curve assessment and examinations to benchmark student performance within the blocks of well partitioned theoretic subjects. The work-integrated program would allow the integration, perhaps an alternative form of transformation, of profession experience and wisdoms back into knowledge theories and concepts during the university studies.

DISCUSSIONS AND CONCLUSION

Non-formal workplace education systems allow students to learn complex but interdependent hands-on knowledge experientially. Through the non-formal workplace learning activities, students are enabled to criticize and fine-grain the knowledge and skills they have been taught in classrooms. From pedagogical perspectives,

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the curriculum design team has to dissect and examine critically the development process of the bachelor student competence that are congruent with the international technology and business professional requirements. A series of teaching and learning logistic procedures have to be developed and tested empirically, using the analytic framework just mentioned. Using the decomposition mapping framework, a large number of teaching and learning issues can be revealed and taken into detailed consideration. The curriculum structure can be designed congruous with the interests of the interdependent education stakeholders, i.e. university, students, and society. The logical dependence of learning components can be visually examined more effective and systematic.

Notably, the curriculum integrated with non-formal workplace learning can ensure the following qualities for the development of the students' competencies on top of the conventional program contents:

- change orientation that means capability to modify and adapt behavioral styles and approaches in order to accomplish goals;
- communication that effectively exchanges information, opinion and idea;
- creativity and innovation that refers to a broad view of using logic and intuition to define problems and seek solutions;
- effective decision making;
- initiative and follow-through that much relates to students willingness to set specific, stretching objectives and meets or exceed them;
- leadership;
- productive planning both in term of efficiency and priority setting for personal values;
- technical and ethical mastery;
- integration of theory and practices; and
- working effectively with others

Further, the decomposition mapping framework allows the inclusion of the following strategic pedagogical aspects:

- methodologies that train and facilitate students to work in different working conditions;
- establishment for effective learning environments by use of experience based methods and experiential learning;
- project-based management skills and leadership;
- methods or guidance necessary for individual participating companies to define appropriate work task requirements;
- knowledge and protocol to deal with ambiguity and crisis;
- assessment of personal competence beyond the academic achievements;
- self-confidence and personal goal development;

In order for the curriculum and the respective materials developed under the project to benefit and add value to all the stakeholders, the project team monitored and evaluated

the structuring of the curriculum contents on more theoretic and logic grounds and took the key roles of ensuring peer assessments, supervision, tuition, evaluation, establishment of teaching portfolios and student counseling during course of work placement. In addition, there were assigned 'discipline trainers', the experts on individual specific disciplines involved in the workplace training.

As a pilot curriculum restructuring exercise to give the new direction of university-wide education strategy, the program should be evaluated with respect to the effectiveness of individual learning, group learning, institutional investment and turnover. A long-term monitoring on the aspect of improving the quality of the curriculum design is also needed. The project team is planning a series of seminars and evaluation processes – involving the program management teams, recruited company participants as well as the government authorities concerned and students – in order to provide for a proper and cost efficient analysis of the achievements and further prospects.

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