An integrated curriculum for developing students' employability

Chi-Cheng Chang

Lunghwa University of Science and Technology
Taoyuan County, Taiwan

ABSTRACT: The purpose of this article is to present an integrated curriculum that aims at developing senior students' employability at work. The study provides an example of a special curriculum that links to enterprises for increasing senior students' employability. Survey research was adopted to find out about learning satisfaction with internship through 64 valid questionnaires. The integrated curriculum with support from enterprises for developing senior students' employability was then tested and verified. The contribution from enterprises offers a better solution for helping senior students to obtain practical knowledge from internship and, as a consequence, this model of curriculum can be used in the design of other department-based curricula in a technological university.

INTRODUCTION

In Taiwan, higher education has been expanding rapidly since 1994, educating numerous university graduates for employment markets. An ironic phenomenon has been noticed that those employees have not benefited from the upgraded and broadened higher education but have their salaries reduced [1]. The key fact was the declining employability [2]. The issues about how to boost employability by means of curriculum planning and design have started to receive unprecedented attention in technology-oriented universities and colleges [3].

In a technology-oriented university, while unemployment has been high, higher education has been expected more in economic functions than in social functions. A student receiving higher education is expected to improve their chance for employment in the future. This has virtually become the universal value [4]. Against such a background, technological university oriented education is supposed to nurture more employees to live up to the needs of enterprises. Further, amidst the rapid changes in the industrial ambiance, curricular panning is required to be closely related to the demands of enterprises [5].

The subjects to provide students with practical skills have become one of the key elements of curricular planning and design. Hands-on experience and accumulated practical work are needed to nurture high level employees by means of industry-university cooperation-oriented education. How should a school team up with industry to broaden students' hands-on experience is a key issue for consideration when seeking to solve the current common problem where a university student becomes unemployed upon his or her graduation.

Experiential education focusing on hands-on practicum in enterprises is deemed as both a philosophy and methodology, enabling both the educators and learners to proceed with direct on-the-spot experiences toward the significant goals to improve their knowledge, develop technology and know-how, and clarify their values. Amidst the hands-on environments of cut-throat competition, a student who is capable of dealing with the increasingly diversified, comprehensive and multifaceted complicatedness and services will improve his or her employability. In entrepreneurial experiences or practicum, the philosophy derives in *education is experience itself*, and *education is simply a journey* [6].

The theories so involved include cooperation education theory and work-based learning theory. A school shoulders the significant responsibility of building a sound environment, which enables students to acquire workplace skills and practicum. Through internship in an enterprise, a student may practically transfer the knowledge and know-how he or she has learned into his or her personnel occupational competence [7][8]. The benefits yielded through practicum in an enterprise include better awareness of employer expectation, competence for concrete assessment of the competence a student already possesses, the capability for concrete engineering planning, natural transformation to assure that the student becomes a new, but well oriented employee in the workplace [6].

Quite a lot of new educational and learning strategies are intended to help students better convert their broad personal technology and know-how in the hands-on environments where they serve enterprises [9]. How should effective means to upgrade work-based learning be developed and converted into personnel skills, and how should students be encouraged to assess results learning? These questions should represent the key points to underline the need for an integrated curriculum [3]. This study, therefore, is intended to construct an integrated curriculum for senior students' employability to offer a handy reference for curricular planning and design.

THEORETICAL BACKGROUD

The work-based learning theory is built upon the philosophy of economic rationalism and guiding learners into the lifetime learning [2]. Under such a philosophy, learners would acquire hands-on and practical knowledge and skills in their workplace in order to respond promptly to markets with their personal knowledge and technology, and know-how. Meanwhile, as the learners get the hands-on experience in the workplace and become accustomed to continuing learning at work, they are able to take the initiative to build the habit of learning [8][9].

Raelin regarded the results of hands-on learning at the workplace as a sort of personal wealth and built the explicit and implicit knowledge and the theory-practice relationship, and classified them into personal and organisational aspects [10]. The personal aspect can be divided into the four categories of conceptualisation, experimentation, reflection and experience. The organisational aspect can also be divided into four categories: applied science, action learning, action science and community of practice. These are shown in Figures 1 and 2. Such categories make up the major facets of student satisfaction level surveys.

KNOWLEDGE

		Explicit	Tacit
LEARNING	Theory	Conceptualisation	Experimentation
	Practice	Reflection	Experience

Figure 1: A model of work-based learning at the individual level [10].

KNOWLEDGE

		Explicit	Tacit
LEARNING	Theory	Applied science	Action learning
	Practice	Action science	Community of practice

Figure 2: A model of work-based learning at the collective level [10].

Internship programmes represent another channel through which students could gain hands-on practical experience on school days. Such practicum-oriented learning can be deemed to be a sort of capability for a student to develop personal potential or what a student needs to do. Students are supposed to position themselves in a society or a situation to learn through interrelationships with people either directly or indirectly [9][11]. Learning competence at workplaces is an extremely important way to help students boost their employability.

Internship programmes could help students develop skills including problem-solving skills, leadership skills, research skills, study skills, communication skills, time management skills, presentation skills, peer assessment skills, self-assessment skills, subject knowledge, teamwork, as well as attitudes to group-work [12]. Chang held that a great majority of employers tend to focus on cultivating multifaceted and converted skills by means of internship programmes, including notably strong interpersonal skills; team players who can also lead a team; and problem-solving skills [3].

A survey conducted on architectural surveyors by the Royal Institution of Chartered Surveyors of their fundamental knowledge and general skills, and capabilities indicated yielding of the general skills including gathering, interpreting and giving information; management of self and others; oral, written and graphical communication; teamwork and leadership; creativity; use of equipment and IT; and analysis and problem-solving [13]. Brumm, Hanneman and Mickelson pointed out that through industry and school cooperation, oriented education with students deployed at

practicum sites, could lead to students nurturing a number of capabilities, e.g. engineering knowledge, general knowledge, continuous learning, quality orientation, initiative, innovation, cultural adaptability, analysis and judgment, planning, communication, teamwork, integrity, professional impact, customer focus, etc [2].

METHODOLOGY

This study adopts methodologies including literature analyses, panel discussions and interviews with entrepreneurs so as to set up integrated curricular framework, develop a learning result satisfaction level survey so as to check and verify the feasibility of such an integrated framework:

- The literature analysis efforts are mainly intended to explore the bases of cooperation education theory and work-based learning theory to function as the foundation to set up frameworks of industry and school cooperation curriculum.
- Panel discussions with professionals in industries and schools to check and verify the effect of the curriculum toward students and, in turn, the level of the curriculum to upgrade the employability, assess the criteria for enterprises to choose the industry-school cooperation curriculum, ascertain the mechanism for enterprises in matching potential students and questionnaires to evaluate the results of learning.
- The efforts of hands-on interviews are intended to interview the enterprises, which participate in the industry-school cooperation curriculum programmes.
- Finally, by means of the match between enterprises and students, surveys would be conducted about the post-enterprise-practicum learning satisfaction level. The questionnaire mainly constitutes eight (8) aspects: conceptualisation (A1~A3), experimentation (B4~B6), reflection (C7~C9), experience (D10~D13), applied science (E14~E17), action learning (F18~F21), action science (G22~G25), as well as community of practice (H26~H29).

RESULTS

The curricular planning framework in the present programme is based on the grounds of cooperation education theory and work-based learning theory aiming at the goal of boosting students' pre-graduation employability.

Industry and school cooperation can be used as a means to help students to acquire practical knowledge and skill learning. Such efforts can be accompanied by brainstorming to set up the internship programme mechanism and the necessary supporting measures. Students are required to come back to school to participate in symposiums or workshops after they complete a phase of the practicum programme. Meanwhile, they should respond to a satisfaction level survey to provide their feedback opinions.

1. *Target positioning:* On the grounds of the educational goals established by the respective department, the researcher should ascertain the type of work, which the graduates could do at workplaces before going any further.
2. *Competency profile:* Through analysis into the jobs at the workplaces, position analysis and duty analysis, the researcher tries to confirm the very essence of the positions and duties for university graduates when they enter the workplaces to, in turn, confirm the profile of general competence, specific competence, managerial competence, and core-based competence.
3. *Curricular development:* Progress of curricular planning and design based on the competency profile development curriculum.
4. *Professional orientation:* The curriculum and coordination with the requirements for competency development are appropriately covered into the professional certificates, with requirements upon students to successfully pass the required accreditations to assure the effect of education of professional skills.
5. *Integrated application:* The *project production* and the works completed in the hands-on work oriented to the industrial demand should be taken to coordinate with the review and competition mechanism to integrate the experiences accumulated by students in the learning process to demonstrate the results of innovation.
6. *Industry and school partnership:* Utilising the social capital to develop the industry and school cooperation relationship and set up sound arenas for student practicum.
7. *Interviewing enterprises:* Through personal interview with enterprises, the researcher should try to look into the working ambiance and conditions at the practicum sites for students.
8. *Screening/selection of enterprises:* Establishment of sound mechanism/regime of enterprise screening/selection, including notably working environments, safety and security of work, profession at work, physical load, educational and training programmes, and philosophy of cooperation.
9. *Matchmaking for right human resources:* Sponsoring interview where manufacturers and students could talk with each other face-to-face to match their respective needs.
10. *Practicum and interview:* Sponsoring programmes to help students approach internship programmes and set up the mechanism/regime for the advisory professors and instructors for their on-the-spot interview.
11. *Continual improvement:* Sponsoring back-to-school symposiums and project study reports for students to listen to their voices and survey the level of their learning satisfaction in the practicum programmes.

The concept analyses of an integrated curricular planning system are illustrated in Figure 3.
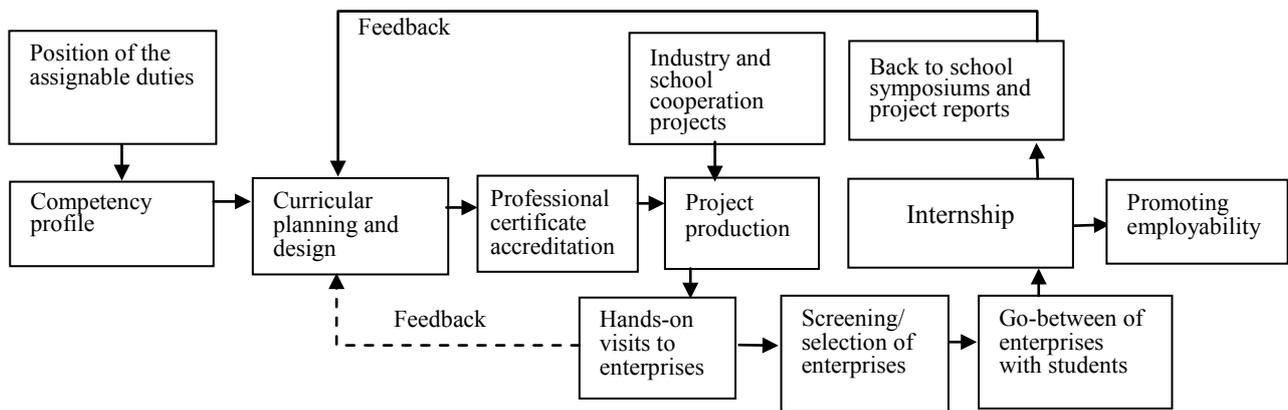
Figure 3: A curricular panning framework for enhancing students' employability.

DISCUSSION

In the industry and school cooperation-oriented education in the aspect of learning target, while the arena for practicum in an enterprise must undergo screening/selection process beforehand, students will be helped to make sure of the contents, and scope of professional skills and competence, the depth and broadness. The cooperation programme is, therefore, target-oriented where:

- Students play the initiative role in the practicum work. The professors and instructors play only the guiding role by the side.
- In the aspect of inter-human actions, students demonstrate heavy aspect of emotion in the hands-on work. Their learning of interrelationship and teamwork skills will enhance their personal awareness, emotion, sociality and values. Through such efforts, they will successfully find out the right jobs. The cooperation programmes would be heavily beneficial to their occupational career.
- In the aspect of skills to solve problems, students would get close the hands-on problems. The cooperation programme would be substantially helpful to them in integrating professional skills and in expertise.

In the integrated programme frameworks, the study takes the information management department of a certain technology based university in Taiwan, for instance, to look into the internship programmes in 2011. A total of 64 students participated in the six-month long practicum programmes. In coordination with the back-to-school symposiums, the author conducted satisfaction level surveys for the internship programmes. The overall creditability of the questionnaire Cronbach's Alpha 0.893 was up to the superior level.

Table 1: Results of satisfaction on averages of category of learning - N = 64.

Gradation of learning	Category of learning	Mean
personal	Conceptualisation	4.17
	Experimentation	4.16
	Reflection	3.93
	Experience	4.00
Organisation	Applied science	4.21
	Action learning	3.72
	Action science	3.73
	Community of practice	3.91

The radar chart has been developed to understand whether the questionnaire survey results indicate that senior students enhance their employability through internship to reach the score of 60 as a generally acceptable level [6]. Therefore, the strength of learning satisfaction on internship was envisaged according to the average for each indicator to form the radar chart as shown in Figure 4 and Figure 5.

Assuming the weighted value for each factor is the same, and taking the 5 level of classification from the questionnaire to have 5 as the highest and 1 as the lowest, then, a triangle can be formed between any two factors. Accordingly, the ratio method was applied to calculation the area of included angle between the two factors (Δ) by the equation $\Delta = 1/2*ab \sin\theta$, where, a, b respectively represents the arm length (for example for $\Delta 1$ area calculation where a = 4.17, b = 4.16). Hence, the strength of enhancing employability indicator is $\Sigma\Delta_i = 66.1$ in comparison to the ideal value $\Sigma\Delta = 100$ (i.e. the two arms a = 5, b = 5), and the strength can reach the ideal value of 66.1% after being true valued. It indicated the senior student who accepted the survey considered the score of about 60 to be at an acceptable level.
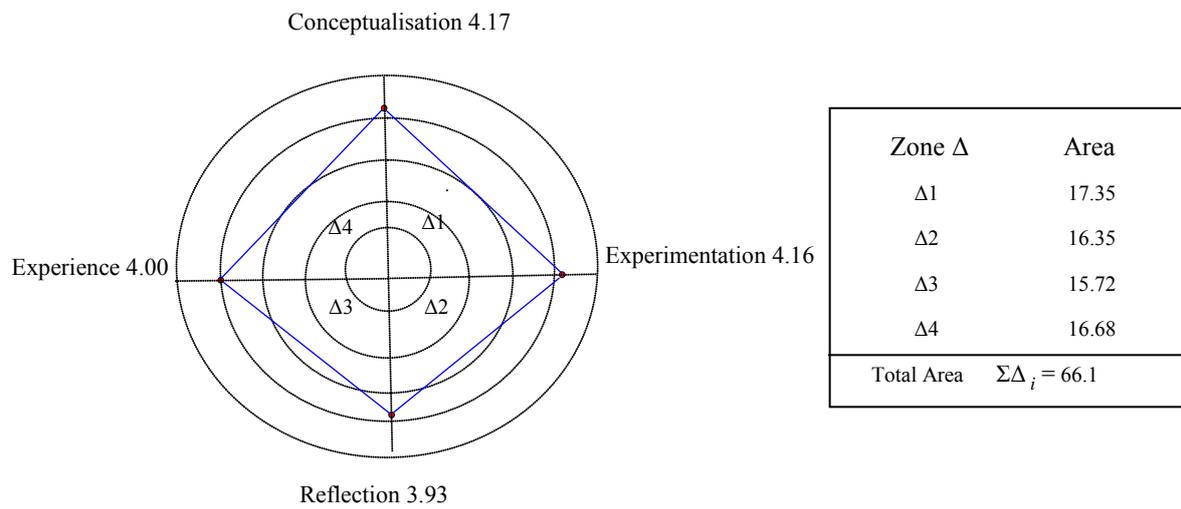
Conceptualisation 4.17

Zone Δ	Area
Δ1	17.35
Δ2	16.35
Δ3	15.72
Δ4	16.68
Total Area	$\Sigma\Delta_i = 66.1$

Experimentation 4.16

Experience 4.00

Reflection 3.93

Figure 4: Area of learning satisfaction on internship at individual level.

Applied science 4.21

Zone Δ	Area
Δ5	15.66
Δ6	13.88
Δ7	14.58
Δ8	16.46
Total Area	$\Sigma\Delta_i = 60.58$

Action learning 3.72

Community of practice 3.91

Action science 3.73

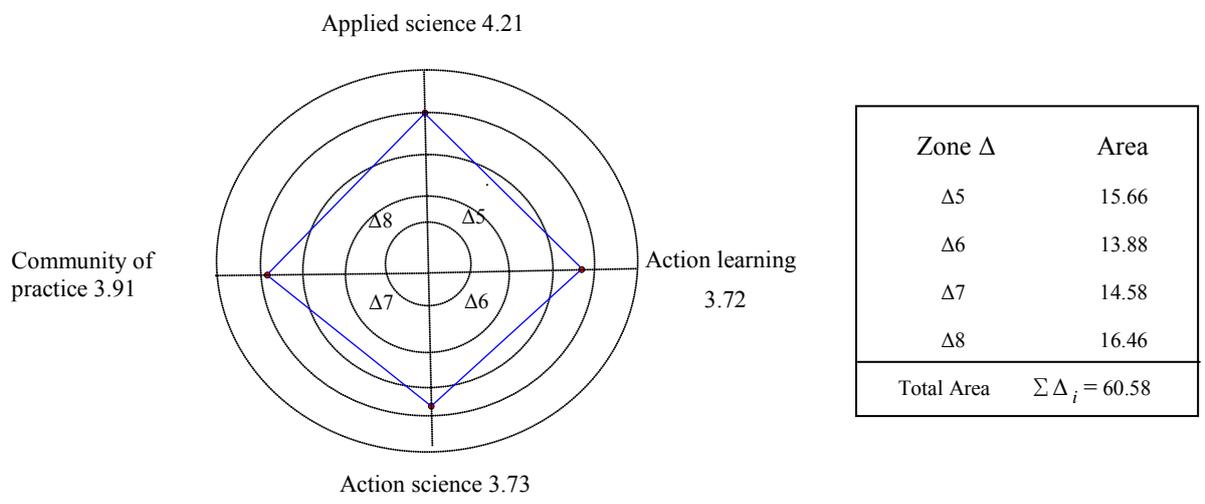Figure 5: Area of learning satisfaction on internship at organisational level.

CONCLUSIONS

In Taiwan, the curricula at technology-oriented schools are practically oriented so as to segment them, as appropriate, from general universities. The internship programmes have been deemed as a very important strategy to boost students' employability and to create a school's market values amidst industries.

The study aims at the work-based theory by starting from cooperation education theory to set up integrated curricular planning frameworks for the purposes of serving as a handy tool to survey the satisfaction level of students in a technology-oriented university, fulfilling the post-practicum learning development after they learn the new knowledge and technology, and know-how to help the students check and verify their satisfaction level in the personal level and organisational gradation and to, in turn, verify the integrated effect of the subject curriculum.

The study, nevertheless, is focusing on the internship programmes as a channel to provide an integrated theoretical and practical learning curriculum for knowledge and technology, and know-how, and does not further probe into other factors that would affect accomplishment of the curricular goal. In the subjects of learning, for instance, as it gets involved in the internship programme on-the-spot professors and instructors, environmental arrangement, contents of the workplace learning and assessment of the results and such diversified, comprehensive and multifaceted aspects.

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