ILM Thinking Model for Building Student’s Intelligent Learning Map Systems

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Abstract: With the rapid development of the Internet technologies, the employment shifts to a highly specialized and skills-based service jobs. However, the reality is that the challenges and opportunities faced by students in this century are unlike those of any previous generation. All students today require specific knowledge and skills in education and career/life planning to support them in making sound choices throughout their lives. By linking education and the world of work, higher education has to find a powerful tool for delivering education that makes their students to meet the requirements of the local economy. Learning map is a quite an innovative approach in education, therefore, it is urge to have a model to let students and educators to know more about it. Thus, this paper presents an ILM (Intelligent Learning Map) thinking model and develops a computer system which combines rigorous classroom instructions with preparation relevant to students’ future careers.

Key words: Learning map, career development, style, intelligent learning system.

1. Introduction

The computer, the Internet, and other technological changes have transformed our lives at school, work, and home. Higher education is absolutely essential to the livelihood of our future workforce and the competitiveness of global businesses. Universities offer a wide course selection to students studying in different fields which will generate various unintended problems. Students may choose a specific course based on the reputation of the teacher, the course time, the course difficulty, or other factors but not directly related to a specific field of study [1]. However, the reality is that the challenges and opportunities faced by students in this century are unlike those of any previous generation. All students today require specific knowledge and skills in education and career/life planning to support them in making sound choices throughout their lives [2].

There are challenges both in constructing a learning map and creating a pathway to success responds to the realities of a complex, rapidly changing world [3]. When you’re a freshman, start planning a career change, on your journey of getting to know yourself better, finding your best career fit, and making a plan that puts your goals within reach [4]. Thus, it is necessary and urges to build an intelligent system where education and career/life program has been designed to ensure that all students develop the capacity to achieve their personal goals for work and life, make successful transitions throughout life, and make positive contributions to their communities. In addition, the focused approach to planning will support students in selecting the courses and programs they need to complete their university education.

2. Perspectives on Learning Map and Career Planning

In the face of such sweeping changes, school offers a wide course selection to students studying in different fields to cultivate their humanistic, occupational and
technological perspectives [5]. There are plenty of courses included in these three perspectives. It is necessary to have a good approach to support students in selecting the courses and programs they need to complete.

Fiske [1] presents a model (see Fig. 1) for how to help students make informed decisions about their future career direction, and then conduct a successful job search. The model suggests that a successful job search encompasses four basic steps: (1) It begins with Self-Assessment—knowing who you are; (2) Exploration of what is out there in terms of interesting industries, fields and occupations; (3) Focusing on specific industries, fields and companies that appeal to you; (4) Job Search stage—sending out resumes, interviewing, and negotiating job offers.

2.1 Career Pathway and Learning Map Model

Current research identifies significant positive outcomes when clearly articulated education and career/life planning programs are implemented across an education system [4]. There is agreement on fundamental principles and concepts, specific learning goals, and the need for a strong commitment to programming that responds to the interests, strengths, needs, and aspirations of all students. Although those improvements are also found in areas such as student engagement, the achievement of personal goals, and the development of independence/resilience, there still is no universal model of a successful education and career/life planning program. It is necessary to have a career pathway systems not only can individualize instruction and guidance to fit students’ interests and talents, but also can increase schools’ abilities to target workforce development to meet the local community’s economic needs [6]. Rigorous coursework is intellectually demanding coursework that engages students in the essential core knowledge and skills of a discipline and contains appropriately sophisticated content [4]. The main purpose of designing a learning map was to facilitate the instructional design of an online interactive learning content to make learning topics more engaging for students [5]. Learning map is a quite an innovative approach in education, therefore, it is urge to have a model or framework to let students and educators to know more about it.

2.2 Thinking Model of Intelligent Learning Map

Since the steps of designing a useful learning map are too complicated to be explicated through a cognitive process, we developed a three layered matrix model to analyze the stages of the design process (Fig. 2). The tasks of intelligent learning map system design include determining the ILM (intelligent learning mapping) style, task, and interface. But how to determine should base on the curriculum goal. Thus, on the pedagogic level, the curriculum goals need to be transformed from departmental core competencies and workforce within the competitiveness of global business goals. The students’ previous skills and the knowledge enhanced also require included [4]. The criterion for selecting the students’ learning style is translated courses selection activities into ILM tasks. The purpose of the ILM’s tasks is to enhance the students’ knowledge and skills through the provision of challenges.

![Fig. 1 Career development pyramid [1].](image-url)
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Pedagogic

Departmental core competencies

Workforce and the competitiveness of global business

Curriculum and Course program goal

Design

Level

ILM Style Design

ILM Task Design

ILM Interface Design

Preparation

Level

The existing knowledge, understanding, abilities, motives and conceptions/styles of learning students already have

Fig. 2 Thinking model of intelligent learning map.

3. Validating the Model: ILM Systems

In order to explain how the above model is useful in supporting students in selecting the courses and programs, a computer system was developed. The ILM Systems include modules for supporting students in identifying their personal needs and in using this knowledge of themselves to inform their choices of programs both in and outside the classroom, that meet their interests.

The web site is http://cmap.tnu.edu.tw. The key features on usage based on the design instruction are listed as follows [7]:

1. Linking departmental core competencies with whole leaning perspectives (see Fig. 3). Every department has their own core competencies and every core competency corresponds to different learning perspectives. Student can use this information when considering a course selection for cultivating their humanistic, occupational or technological abilities.

2. Comprehensive course information and courses map (see Fig. 4). A course map is a template for creating an “at a glance” representation view of a course or module and a well-defined course map can put students on track for their better learning outcomes.

3. Linking departmental core competency with
courses (see Fig. 5). These departmental core competencies can be applied in many contexts and must be developed over a lifetime. They specify how learning can be expressed and assessed in practice. Linking departmental core competency with courses can provide the information to student who completes the course program should have achieved the listing outcomes:

![Fig. 4 Course information and course map.](image1)

![Fig. 5 Linking departmental core competency with courses.](image2)
(4) License course: practical training map (see Fig. 6). The module expresses what courses curriculum has been covered the specific licenses.

(5) Linking occupations with course program (see Fig. 7). The module shows the relationships between course programs and occupations. Higher education program helps prepare students for life after graduation. A course program contains a serious of courses in various technical and vocational subjects to provide students with the skills and knowledge necessary to enter an occupation.

(6) Linking occupations with departmental core competency (see Fig. 8). The relationships between core competencies and occupations are illustrated by...
the radar chart. Students can understand which and how many core capacities they should have to an occupation.

(7) Linking occupations with human resource headhunters (see Fig. 9). When students are interested or looking for an occupation, the modules provide a hyper link to a popular headhunter agent [8] and show the potential job opportunities.

Students who enroll as a freshman starting coursework selecting with ILM learning map system which offers a procedure to empower students to design and plan their own learning lives on campus, they are engaged, they achieve, and they find themselves applying their learning in their daily lives. In an environment that encourages such learning, students develop confidence in knowing that their
school programs are created with them in mind, that the world beyond school has something to offer them, and that they have something to offer the world [4].

4. Conclusions

Construct a well learning map is a complicated task. One must consider numerous factors such as education organizational goals, departmental core competencies, course curriculum, course program design, career challenges, etc. Much effort exerted in the designing of ILM should also be targeted at achieving the curriculum goal through relevant learning theories, contexts and learners’ characteristics. The primary intention of this paper is to present an ILM thinking model that makes designing and evaluating higher educational learning map less complicated and more effective. This model stresses the importance of focusing on the purposes in each step and their relationships to achieve of students requiring specific knowledge and skills in education and career/life planning.

By using the model, a computer system called ILM learning map system was built to facilitate student’s course selection. Departmental core competencies, course programs, and related job occupations can be easily reached using different system interfaces that produce specific results to students.

Due to the constraints imposed by the budget and the learning platform, the model in the study was only applied in my school. In order to measure the program effectiveness to ensure student success, there is lack of students’ satisfaction investigation and feedback to the system for modification. Currently, the learning map is a very popular subject. We expect that in the future, this paper’s model can be further applied in the different higher education institutes.

References