

A PROFESSIONAL COMPETENCE EVALUATION SYSTEM FOR COLLEGE STUDENT

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Keywords: Competence, Evaluation, Course, Assessment

Abstract

The research develops an evaluation system to estimate a college student's department professional competences. In college the professional competences are generally proposed by a department that specifically describe the professional skills and targets their students will possess or achieve after graduation. Rather than using a score to represent a student's learning, the developed system is designed to evaluate a student how they have learned the competences after taking the courses and exams in a department. So this paper focuses on introducing how to evaluate a student's professional competences in a department through quantifying and building the relation among the course, assessment and competence. The feedbacks of this evaluation system help teachers not only understand a student's competences but also inspect whether their course design and learning activities are conforming to the entire department development.

1 Introduction

Every college department has its particularly professional knowledge and skills applied for employment. Accordingly, department professional competences are set as learning targets that students are expected to possess after graduating from school. Many scholars have attempted to define competence and numerous studies have developed, examined or applied assessment and validation techniques for evaluating performance by analyzing competences [1]. Some scholars [2, 3] described the core intent of competency as "an underlying personal characteristic which results in effective and/or superior performance in a job" or "an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation." Competency is defined as the "underlying characteristics" that can be used to predict the job performance of specific professionals. Competences are long-lasting characteristics that comprise motives, traits, self-concept, knowledge and skills, and can be demonstrated in thinking, behaviors or onsite responses. Furthermore, researchers defining competences agreed that they can be trained and improved [3, 4, 5, 6]. The trainability of competencies has major implications for training departments and educational institutions.

2 The components of the evaluation system

The major purpose of this system is assessing students' department professional competences after a serial of courses designed and arranged by department course developing committee. Generally, in order to represent a student's learning performance a score is used to express whether the student is qualified for this course's learning objectives. But in fact a course may include plural professional competences that a student need to learn and pursue. In order to inspect whether a student is mastering professional competences in a course more or less, the relation among course, assessment and professional competence as the Figure 1 shows.

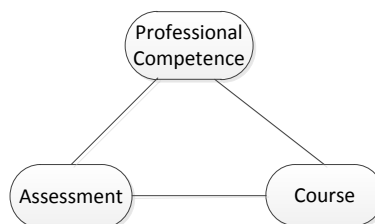


Figure 1: Three parts for constructing the evaluation system

The following sections detail how we connect the three parts.

2.1 Build the relation between course and professional competence

In this section, a Course-Competence table will be introduced to describe the relation between course and professional competence that a department course committee needs to conduct a discussion for accomplishing it.

2.1.1 Construct Course-Competence table

The first step of carrying out the competence evaluation system is constructing the Course-Competence table that describes the relation between courses and competences. Because a course may contain different professional knowledge and skill for learning, which means more than one professional competences may exist in a course only the matter of ratio. The course committee needs an entire picture of department development for constructing the Course-Competence table. For instance, Table 1 is the department of Digital Information and Library Science (DILS) in Tamkang University (TKU) in Taiwan, the first column lists the a few example course titles of the department and the rest of

columns are professional competence index and their ratio contained in these courses. The details of the eight competences A to H are described in the Table 2.

Course	Competence Ratio (%)							
	A	B	C	D	E	F	G	H
Introduction to librarianship & information science	20	20	15	20	20	0	5	0
Statistics for library science	0	30	35	0	35	0	0	0
Introduction to innovative publishing industry	0	0	0	20	0	0	40	40
Archive management and development	0	25	15	0	20	40	0	0

Table 1: A Course-Competence Table

Competence	Description
A	Have the competences to know the library and information science principles and trends
B	Have the competences to develop, organize, archive and integrate various information resources.
C	Have the competences to realize information theories and apply information systems
D	Have the competences to communicate and coordinate information services.
E	Have the competences to manage information services in various libraries and institutions
F	Have the competences to manage digital documents and file archives.
G	Have the competences to integrate traditional publication affairs and library works.
H	Have the competences to integrate library works and digital content industry.

Table 2: Professional competences of DILS, TKU

2.1.2 Add competence information in course syllabus

As the Figure 2 shows, while teacher is designing a course syllabus on line, system automatically retrieves the competence information from database and adds it to teacher's syllabus. It is a significant step that reminds teachers or instructors what competences should be learned after taking this course. The competence information gives teachers a direction to prepare teaching content and design learning activities. Meanwhile it's also an opportunity to reconsider whether the relation set between the competences and the course is properly matched.

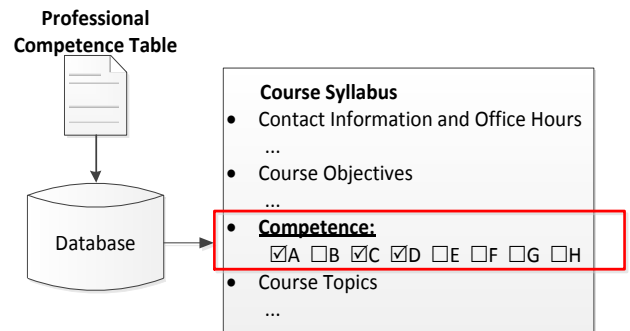


Figure 2: System retrieves competence information from database then adds it to a course syllabus

2.2 Build the relation between competence and assessment

In the previous section, the Course-Competence table has been built to describe the relation between course and competence. The competences are not only the specific learning objectives but also taken into account when we are evaluating student's learning. In this section we focus on how to infuse the competence factors into traditional exam process.

2.2.1 Exam Authoring Tool

The connection between exam and competence includes two parts; first is connecting a competence-oriented item bank, the other is an exam authoring interface which primarily helps teachers picking up questions from item bank. The authoring tool architecture is illustrated in Figure 3.

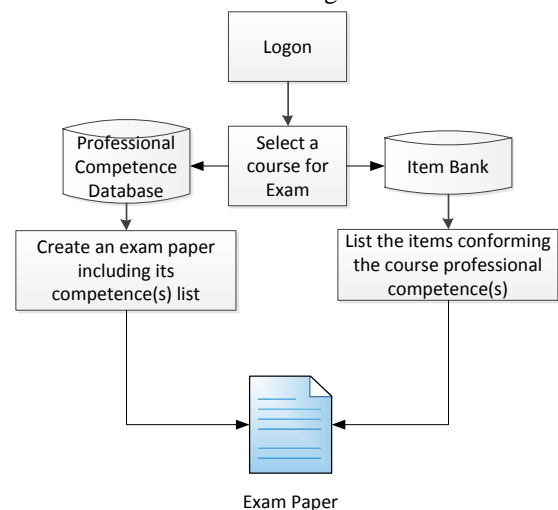


Figure 3: Exam authoring tool architecture

2.2.2 Provide competence ratio information for teacher editing exam paper

As the Figure4 shows, that's similar to the competence information added in a syllabus. While teacher is starting from a blank exam paper, the professional competence ratio information of this course is automatically retrieved from

database then added on an exam paper that reminds a teacher the competences should be evaluated in this course.

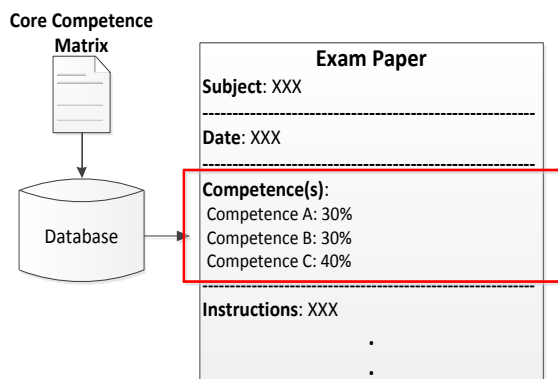


Figure 4: A course professional competence ratio added on exam paper

But the notable point here is that the competence ratio information is not used to instruct teachers to create an exam completely conforming the ratio but remind teacher the ratio could be a reference kept in mind while editing the exam. The teacher still has the flexibility to edit the exam paper content according to their teaching progress and professional knowledge

2.3 Build the relation between competence and grade sheet

A teacher generally proposes a few testing activities to evaluate student’s learning, such as paper works, presentations, exams etc. In order to express how students have learned the competences, a grade is separated to its corresponding competence grades. Take the Figure 4 for example, a student who gets 80 in midterm which can be extended to display his/her each competence score. When a teacher fills in the score which will be automatically separated to the three competences grade according to ratio defined in the Course-Competence table. The grade of competence A in midterm is 16 because the midterm contains 50 percent of the entire course grade and the ratio of the competence A is 40%, so the result is multiplying 80 by 50% and 40%.

No.	Department	Student Number	Name	50.0	50.0	100.0
				Mid	Final	
011	DILS	49800016	Jeremy Lin	80	90.0	85.0
				12.00	13.50	25.5
				12.00	13.50	25.5
				16.00	18.00	34.0

Competence C:30%
Competence B:30%
Competence A:40%

Figure 4: Grade sheet with competence calculation

The grade sheet also allows a teacher to manually fill in or adjust the grade for each competence; the default competence score is calculated according to the ratio of competences of this course.

3 Conclusion and future work

College students may take a serial of training courses for acquiring the professional knowledge and skills in a particular department, but the results can’t be completely represented or measured by a grade due to every single student has his own personality and competences. So the contribution of this proposed evaluation system is to understand a student what professional competences he have learned from the studying in a department. Moreover the evaluation feedbacks can not only help a teacher inspects the relation between their teaching and these professional competences but also provide valuable information for reviewing the entire department course structure. Our future works will include the visualizing the evaluation results and resolving the calculation problems caused by elective courses and data normalization.

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