

## STANDARDIZATION OF COOPERATIVE EDUCATION PROCESSES VIA MANAGEMENT INFORMATION SYSTEMS

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**Abstract:** Various university programs around the world are in need of cooperative education to meet the growing needs of the global business. Short-term internship experiences are inadequate especially in engineering programs. Cooperative education can be added in curriculum of universities to increase collegians' work experience and to develop university-industry cooperation. In this study, a conceptual model is built for cooperative high education process via using management information system to facilitate and simplify the whole cooperative high education process. The proposed model is useful both industry and universities.

**Keywords:** Cooperative education, Management information systems, Standardization

### INTRODUCTION

Developments in the industry and service sector has led to the need for experienced staff. Short-term internship experience is inadequate especially in engineering programs. Cooperative education (co-op) that combines classroom learning with learning at the workplace aims to fulfill the need of highly skilled labor in competitive industry.

Co-op was developed at the University of Cincinnati (UC) in 1906 by Herman Schneider. As shown in Table 1. there are many co-op applications all over the world applied over a century; university of Waterloo, Northeastern University, Wentworth Institute of Technology, Georgia Institute of Technology, Drexel University, Purdue University and etc. Co-op education in Turkey started with TOBB University of Economics & Technology, Gaziantep University, Sakarya University (“UMDE”, “3+1” & “7+1” programs), Bahçeşehir University and Süleymanşah University implement co-op education.

Table 1. Universities with over-a-century co-op experience

|      |                                   |
|------|-----------------------------------|
| 2006 | University of Cincinnati          |
| 2009 | Northeastern University           |
| 2009 | Drexel University                 |
| 2009 | Kettering University              |
| 2011 | University of Detroit Mercy       |
| 2012 | Georgia Institute of Technology   |
| 2012 | Rochester Institute of Technology |
| 2014 | University of Akron               |
| 2019 | Drexel University                 |

Co-op is a learning method of combining conventional education with industrial experience. As mentioned above, cooperative education models are being implemented throughout the world in different ways, depending on national and local circumstances, national policies on vocational education, social and economic structures, historical contexts and school and university systems (Arslan et al., 2013). Although there are many co-op applications all over the world for a long period of time, a rational structure for monitoring, analysis and management of this system does not seem to appear both in related literature and industry. An MIS is developed to enable evaluating coop education programs and to fulfill the potential of coop partners such as, students, employers and academics.

### **Difference between co-op and internship programs**

Co-op learning model consists of students performing a full-time paid employment as a structured part of their program of study. Co-op programs help students and academics to integrate industrial field experience and academic experience (Weisz and Smith, 2005).

Co-op experiences are either full-time alternating periods of work and school or part-time combining work and school. Co-op experiences also supervised by a field related professional in partner institution. Usually co-op students are offered at higher salaries when they apply to a related position.

Internship programs often carry on in the summer. It can be full or part-time, paid or unpaid, depending on the employer and the career field. Students don't have to miss a semester or two to complete an internship. An important point is that, internships are usually limited to one area of responsibility ("Co-Op vs. Internship: What's the Difference?", 2010).

### **Benefits and challenges of co-op education**

The benefits to all partners of co-op programs have been mentioned below. Academic benefits to students include increased disciplined thinking improved motivation to learn and problem solving skills, an ability to apply theory to practice and improved academic grades (Weisz and Smith, 2005). Furthermore students may practice in human relations skills, clarify of career goals, Improved self-reliance, self-confidence, responsibility, improve Contacts with potential employers (Kerka, 1989). Higher starting salary after graduation is the one of the important benefits of co-op education. Benefits to partner institutions are; effective screening, selection, and recruitment, higher employee retention and productivity, highly motivated employees with realistic expectations, lower recruitment and training costs, opportunity to influence curriculum design and content, improved public relations (Kerka, 1989). Benefits to academicians are; finding potential sources for fundraising, finding project partner, updating of the curriculum, developing university-industry cooperation.

Despite the many benefits of co-op education there are several challenges in practice. For instance, academic supervisor's workload is usually high and mostly undervalued for this reason supervisor may not have the time to check all work placements thoroughly enough to ensure that the appropriate learning opportunities are being provided for students. Similarly, mentors in PIs may also not have the time because of their responsibilities to the companies. Finding work placements are difficult. Work in mentoring cooperative education is not recognized nor it is rewarded through the process of academic promotions (Kerka, 1989). Students may not spend their time productive due to lack of tasks.

### **PROPOSED CO-OP MANAGEMENT MODEL**

In this study a conceptual model is built for cooperative high education process via using management information system to facilitate and simplify the whole cooperative high education process. A step-by-step application scheme for proposed co-op management model is illustrated in Figure 1. First step is related to acquiring demands. These demands include student, partner institutions and academicians. For instance, a partner institution might want to prefer an academician who works in a specific field and also a student might want to work a specific department of a company. Following the having request co-op management commission in relevant department of university analyze whole demands. Annual protocols signed with the appropriate institutions. In the fourth step student, partner institutions and academicians is matched each other. In the co-op education process the whole of partners give reports. At the end of the term, final grades of student, partner institutions and academicians are determined. Partner institutions' and academicians' final grade light the way for planning future periods of co-op education. These steps draw a frame for co-op education process and the frame might go into more detail due to specific university department.

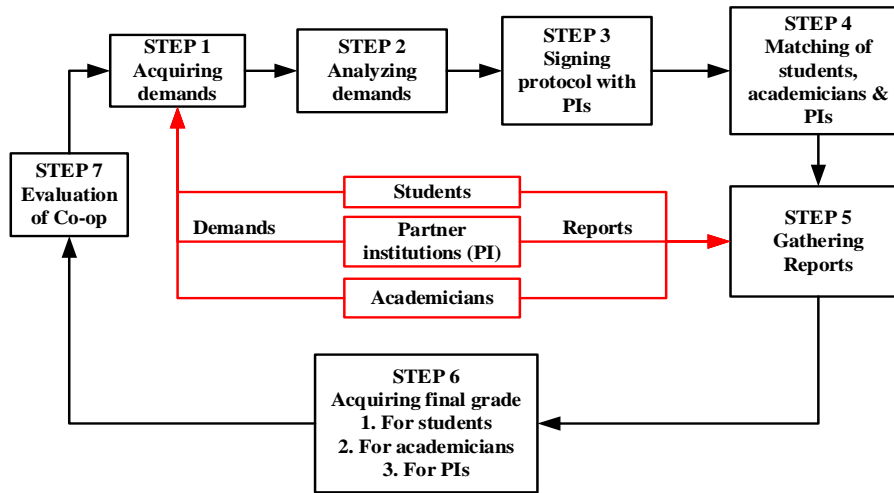


Figure 1: Proposed steps of co-op education

### A MANAGEMENT INFORMATION SYSTEM FOR CO-OP EDUCATION PROCESSES

Co-op model has a wide range of applications in the world and as well as Turkey. Although there are many co-op applications all over the world for a long period of time, a rational structure for monitoring, analysis and management of this system does not seem to appear both in related literature and industry. An MIS is developed to enable evaluating co-op education programs and to fulfill the potential of co-op partners such as, students, employers and academics.

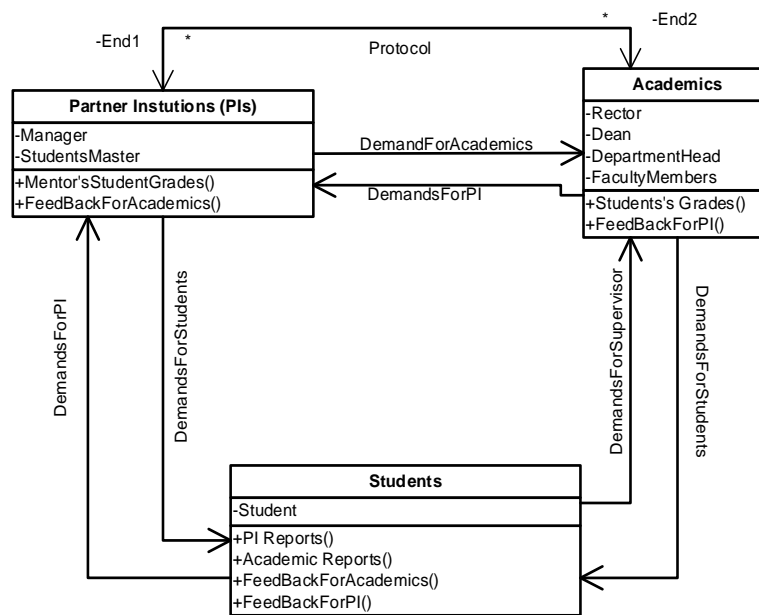


Figure 2: UML Diagram of current co-op workflow

In current co-op applications mostly the data and information exchanged by the partner (institutions, students, academicians etc.) are carried out by universities' staff without having an integrated MIS. Current workflow of the process and information exchange of the partners are shown in Figure 2.

In the proposed MIS model for management and standardization of co-op processes, data and information exchange by the partners are carried out by one central information processing agent which is defined by the authors as SCOOP. As seen in Figure 1, steps of co-op process involves different types of demands, protocols, reports and feedbacks. The proposed SCOOP model enables to manage all inquiries including demands, protocols, reports, feedbacks and etc. in one central information processing agent as shown Figure 3. All interaction between partners are performed via a user interface. Data gathered from different partners and processes are stored in a central database. Any partner who wishes to get a customized report will be able to access a flexible reporting tool with the help of this database. Also a blind feedback process will be held by SCOOP.

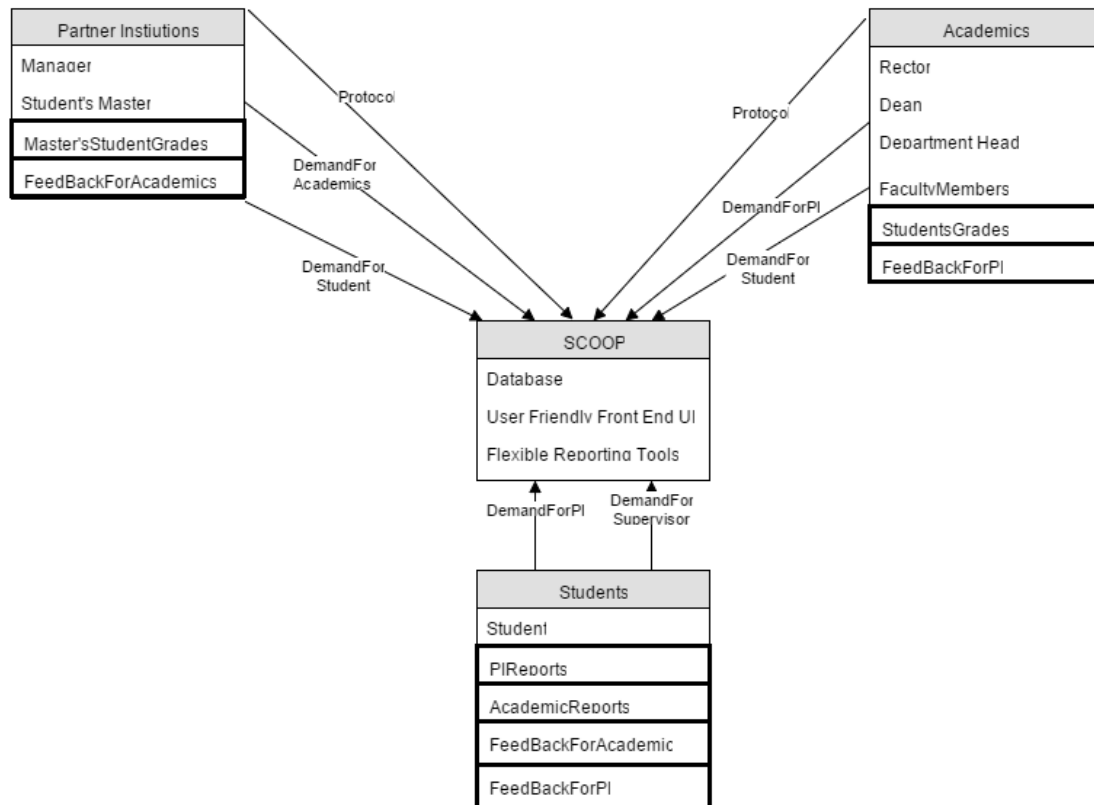


Figure 3: Proposed SCOOP - standardization of co-op management agent model

## CONCLUSIONS

Co-op education model is a combined education model including both classroom education and work place education. This education model has a wide range of application in the world and in Turkey. In this study, authors have developed an integrated MIS model for management of co-op processes. The proposed model has been presented to cooperative learning practitioners in a university and the model was further developed according to feedback from them. As a result of bilateral negotiations with cooperative learning practitioners, it has kindly agreed to the applicability of the model. As mentioned before co-op learning model is applied in the different universities around the world. It is hoped that the proposed model can be used by all practitioners who intend to enhance their co-op management experience. As a further study, authors anticipate a cooperative learning quality system to be developed under favor of the proposed process standards model.

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