



Research Report

Cooperative Education at the Riyadh College of Technology: Successes and Challenges

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In this paper we provide a description of a cooperative education program developed in the Kingdom of Saudi Arabia. The Riyadh College of Technology introduced a cooperative education in 1997, covering a variety of technology areas such as chemical, electrical, mechanical and administrative technologies. The program has shown spectacular growth and the authors conducted an evaluation of the program seeking views of employers, College staff and students. The research findings suggest that all three parties are positive about the program, but the rapid growth in enrollments has created a number of challenges, such as the difficulty in securing work-placements in private sector companies, along with a shortage of financial resources and personnel (*Asia-Pacific Journal of Cooperative Education*, 2002, 3(2), 1-7).

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In its modern history, Kingdom of Saudi Arabia has experienced enormous economic development that has affected every aspect of contemporary life. During the progress of this development, a number of challenges have appeared. One of the most critical challenges has been in the training of a national workforce with a high level of competency in a variety of fields, a good sense of responsibility, and a high degree of productivity. All of these attributes are essential in that individuals need to acquire such skills and attributes in order to cooperate and to maintain the pursuit of development in the Kingdom (The Manpower Council, 1997).

The importance of developing national workforce, particularly in technical fields, has received considerable attention in the Kingdom during the past few decades. Such a trained workforce is expected to contribute to the national development plans. The quality of contribution from a skilled workforce is considered to provide an indication of the success of the nation's educational and training institutions. Success in training of the nation's workforce is considered to be necessary to reduce a perceived gap between the needs of the labor market and the competencies required by technical graduates. As consequence, many higher educational institutions have introduced cooperative education as part of their academic programs of study. It is now believed throughout the Kingdom that cooperative education is a key element in providing harmony between what the student learns in the classroom and laboratories, and what is required in the workplace.

Riyadh College of Technology, one of the leading tertiary education institutions in Saudi Arabia, has recently introduced a cooperative education program. At the College it is believed that cooperative education has the potential to enhance students' attitudes and skills enabling them to adjust to the nature of the work after graduation. The cooperative education program was introduced in 1997, and it is now appropriate to examine its strengths and weaknesses. Such evaluation will enable the College to compare the work-based learning program against internationally accepted standards for cooperative education.

In this paper the authors describe the introduction of cooperative education at the College from the different perspectives of those who are involved; namely, workplace professionals of the various enterprises involved taking on students, faculty from the College who supervise students enrolled in the program, and students who have completed work placements in the past few years.

The Development of Cooperative Education at Ryadi College of Technology

The consideration of a cooperative education at the College began as many educational programs worldwide realized the need for practical training as a means to establish harmony between the role of educational institutions and the needs of the labor market. Consequently, many colleges and universities across the

world have introduced cooperative education programs (Barry, 1973).

Some countries such as the United States, Canada, and the United Kingdom, have established themselves as leaders in this field. However, other developed and developing countries have introduced cooperative education as an integrated part of their educational and training programs. The spread of cooperative education has thus occurred throughout the world. For example, in the United States, there now are more than 500 universities and colleges offering cooperative education programs, involving more than 97,000 companies, enterprises, and government agencies.

In addition, many multinational corporate organizations have become involved in work-based learning as they observe the benefits of cooperative education programs. Hence, the multinational organizations have begun to work with various educational institutions in order to attract and select the best possible employees. Recent studies show that some 80% of the largest 50 American companies now participate in cooperative education programs - a clear indication of the success of cooperative education programs.

Hurd and Hendy (1997) suggest that there are 10 main reasons that encourage companies in the United States to participate in cooperative education programs. These are:

1. *Improving the company's image.* In this case many officials of large companies believe that the involvement of the companies in cooperative education programs convinces the public opinion that these companies are fulfilling their service to the society as 'responsible citizens'.
2. *Recruitment.* It becomes easier for companies to acquire the talent that they need when they participate in cooperative education.
3. *Saving time and money.* Some companies indicated that their involvement in cooperative education provided them with an active workforce in areas where it is usually difficult to recruit.
4. *Production.* Some companies, which have participated in cooperative education programs, found that co-ops are more productive than those who go through traditional academic programs.
5. *The cost in time and money.* As the experience of some companies such as Lockheed has shown, the cost of participating in cooperative education programs is similar to the cost for improving individual skills of the Company workforce.
6. *Retention rate.* Employees who work for companies and who have received cooperative education, tend to be retained to a greater extent.
7. *Level of employment.* Many senior employees of Union Carbide (e.g., those responsible for the supervision and inspection of chemical-based industries worldwide), are co-op graduates. Likewise, most of the talented employees for Alluiz Huntington (an executive management organization), have done co-op programs.
8. *Professional improvement.* Many co-op graduates have found that work-based learning afforded them the best means for choosing the right job.
9. *Social considerations.* Chrysler, the large US car manufacturing company, believes that cooperative education offers it a great opportunity to hire employees from underrepresented groups such as women and ethnic minorities.
10. *New ideas.* Arthur Anderson Co. believes that the students who have taken cooperative education have a higher level of ability in terms of personal learning skills, problem-solving, and flexibility.

Hence, a number of educational institutions in the Kingdom of Saudi Arabia decided to introduce cooperative education programs. In doing so these institutions sought to enhance industry-university contacts and to better prepare students for the realities of the workplace.

Context

The introduction of cooperative education in the Kingdom dates back to 1969 when the King Fahd University of Petroleum and Mineral introduced a cooperative education program in association with Saudi Aramco (the national petroleum company). The University introduced the program for the students in colleges of Applied Engineering, Industrial Management, and Computer Sciences, with a work-based component an integral part of these academic programs. The training period contributes nine credit hours and these form part of the total number of credit hours allocated for the completion of each academic program. The University thus became a leader in this field of cooperative education in the Kingdom, and during this 'experiment', the University acted as a model for the introduction of cooperative education in other institutions throughout the nation (Alabdulahfez, 1999).

As a result of the King Faud University's experiment with work-based learning, other institutions of higher education introduced different types of cooperative education, such as summer internships. For example, King Saud University in Riyadh, King Abdulaziz University in Jeddah, and King Faisal University in Al-Ahsa all have introduced cooperative education in the form of summer internships.

More recently, a number of the technical colleges have introduced cooperative education into their two-year academic programs. These colleges include Dammam College of Technology, Jubail Industrial College, the Institute of Public Administration and, the subject of this study, Riyadh College of Technology (Aleisa, 1995; Aleisa & Alabdulahfez, 2001).

Hence, although a relatively recent innovation in the Kingdom, the concept of cooperative education is spreading throughout the nation as tertiary institutions seek to strengthen the relationship between academia and the workplace. However, there have been few detailed evaluation studies of co-op in Saudi Arabia, and it is thus timely that the 'experiment' with cooperative education in Saudi Arabia is evaluated in an appropriate manner.

Riyadh College of Technology was the first college of technology established in the Kingdom. The College was established in 1983 to help prepare a national workforce in a variety of technical fields. The College, with more than 4000 students in 2001, offers two programs: an associate degree program and a B.S. program. Cooperative education became a required part of these academic programs in 1997.

The co-op program aims to achieve number of objectives as detailed below.

1. To offer students an opportunity to adapt to a real work environment in which they are likely to work upon graduation.
2. To enable students to apply their skills and knowledge in particular fields, in order to be fully prepared, professionally, technically, and psychologically.
3. To offer students an opportunity to explore the nature of possible future employment opportunities.
4. To reduce the gap between teaching practices in the College and the requirements of the labor market.
5. To help the College to exchange information and ideas with professionals in industry.
6. To keep the College management up-to-date about the requirements of the labor market.
7. To enable College faculty and instructors to gain more experience in their fields of expertise.
8. To enable commercial enterprises to identify suitable, talented, students as potential future employees during.
9. To provide an opportunity for public officials in the workplace to gain an understanding of students' abilities and level of their theoretical and practical knowledge.
10. To provide an opportunity for employers to participate in the development of College curricula.

In addition to the above-mentioned objectives, the College believes that cooperative education has a positive influence on the following factors:

1. A positive attitude of Saudi businessmen to Saudi labor.
2. A positive attitude of College graduates to seek employment in the private sector.
3. A positive impact on cooperation between the private sector and educational institutions in the area of training.

Cooperative education was thus introduced in 1997, with the first cohort of students entering the workplace in the summer semester of 1998. At present, all students in the College must enroll in the co-op program, which comprises one semester of relevant work experience (i.e., a total of 12 weeks spent in the workplace).

A training program for each student is prepared according to a plan set by a College supervisor in conjunction with his/her counterpart in the workplace. In addition, the Cooperative Education Office at the College provides supervision of the training program in conjunction with the relevant academic departments. This cooperation ensures that departmental faculty prepare a training plan for each student - usually after a site visit. Faculty also evaluate student performance at the end of the training program. The workplace supervisor makes weekly reports about the progress of the students during their training, and provide an end-of-placement report summarizing the student's overall achievement.

The College has set a number of academic requirements for the cooperative education program that all students have to fulfill. These requirements are:

1. Students must successfully complete at least 60 credit hours (out of 90 credit hours) before they can register for the cooperative education program.
2. The duration of the training must be no less than 60 consecutive working days, or 12 weeks.
3. Students must achieve a mark of at least 60% for their workplace the evaluation report in order to pass the first phase of the evaluation process.
4. Student must prepare an end-of-placement report about the training program. This report is discussed with the student and evaluated by a committee of academic staff, consisting of faculty from the appropriate department at the College.
5. To achieve a pass for the co-op program, a student must get at least 60% for the total assessment (i.e., employer and College evaluation).
6. In cases in which students fail to achieve 60% for their total assessment, they must subsequently register for a second placement, with a different organization.
7. The training is based on full-time work. Hence, students are not allowed to register for any academic courses during the work placement.
8. Students are given a final mark for their placement and this is forms part of their academic record.

Table 1

Enrolments for the Riyadh College of Technology cooperative education program from 1998-2001

Year	Technology Program					Total
	Mechanical	Electrical	Chemical	Electronic	Administrative	
1998	91	51	44	46	99	331
1999	109	88	51	94	98	440
2000	129	115	89	201	178	712
2001	258	182	96	446	264	1240

Table 2

Employer involvement in the Riyadh College of Technology cooperative education program from 1998-2001

Year	Public Sector	Private Sector	Total
1998	19	60	79
1999	25	101	126
2000	22	107	129
2001	30	235	265

Table 1 shows the number of students registered for cooperative education program from 1998 - 2001. The number of organizations that participated in the program at the same period is shown in Table 2.

Purpose and Methodology for the Study

This paper aims to explore some of the aspects of the experience of Riyadh College of Technology in the introduction a cooperative education program. The evaluation sought to gain data about the following issues.

1. The views of workplace authorities about the importance of the cooperative education program introduced by the College and their views on its chances for success.
2. The views of the College supervisors about the mechanism used to implement the co-op program, and the extent to which the program benefits the trainees and work places involved.
3. The views of workplace supervisors of obstacles faced during supervision and about the chances of obtaining future the training in these work places.
4. The views of the student trainees, that have successfully completed the program - about the duration of the program, the level of supervision from the College, and the extent to which the students felt they benefited from the co-op program.
5. The views of the student trainees, who successfully completed the program, about the level of cooperation they experienced in the workplace and about the difficulties that they encountered during their placements.

Some 37 workplace supervisors from the enterprises that participated in the co-op program were selected randomly from about 120 companies and completed a questionnaire (Table 3). Data for College supervisors views are presented in Table 4 and students randomly selected from those who had successfully completed the co-op program in Table 5.

Research Findings

Evaluation of RCT Cooperative Education Program

The results from the questionnaires were analyzed responses summarized using percentiles. The findings are

reported in Tables 3 - 5 including the views of the College supervisors, employers and students.

Overall the evaluation of the co-op program is positive, with all of the employers rating the overall evaluation as positive or intermediate, and 92% of the students stating that the program met their expectations. Likewise, all three parties felt that the duration of the program was appropriate (87, 96, and 82% positive/intermediate rating by employers, College supervisors, and students respectively) that the training was based on the co-op plan set before the placement (100% positive/intermediate rating by both employers and College supervisors), that the program enabled students to acquire a positive attitude towards working (87% for College supervisors) and that the program gave students needed workplace skills (91% positive/intermediate rating by students).

The College is encouraged by these findings, since they indicate that the introduction of cooperative education has worked in this environment. The interaction between the College and the workplace helps the staff to improve the preparation of the College supervisors so that they can positively participate in the program and execute their supervision and evaluation duties effectively. Developing a positive attitude toward work, is clearly a benefit for students (see above). However, some of the perceived benefits for the students were not specified in responses to the questionnaire. Informal interviews suggest that these were related to things such as learning to apply practical skills, acquiring gaining knowledge about a real work environment, gaining awareness problems encountered by employees in the private sector, and learning about employment opportunities in the labor market.

Despite the overall positive results, there were some challenges identified in this work. These are detailed below.

Workplace Challenges

Some of the students found difficulties in communication skills especially in the use of the English language.

Having the work placement a semester before graduation restricts the employers' ability to take students on directly into employment. To address this issue, a number of companies have requested that the placement be held after students complete the academic requirements for their degree. This might explain why some 26% of the students said they would not like a job in the company as they did their placement (Table 5).

Table 3

Employer evaluation of the Riyadh College of Technology cooperative education program (n=38)

Questionnaire Item	Positive (%)	Intermediate (%)	Negative (%)
Co-op program achieves its objectives	27 (71)	11 (29)	0
Supervision from the College is appropriate	20 (53)	15 (40)	3 (8)
Mechanism for the implementation is appropriate	24 (63)	12 (32)	2 (5)
Number of visits from the College supervisors is appropriate	19 (50)	12 (32)	7 (18)
Duration of the co-op training is appropriate	6 (16)	27 (71)	5 (13)
Training is usually based on the training plan	19 (50)	19 (50)	0
Overall evaluation of co-op program	17 (45)	21 (55)	0

Table 4

College supervisor evaluation of the Riyadh College of Technology cooperative education program (n=23)

Questionnaire Item	Positive (%)	Intermediate (%)	Negative (%)
Co-op program achieves its objectives	13 (57)	8 (35)	2 (9)
Supervision from the College is appropriate	2 (9)	18 (78)	3 (13)
Mechanism for the implementation is appropriate	12 (52)	7 (30)	4 (17)
Number of visits from the College supervisors is appropriate	17 (74)	5 (22)	1 (4)
Duration of the co-op training is appropriate	2 (9)	20 (87)	1 (4)
Training is usually based on the training plan	6 (26)	17 (74)	0
Co-op program enables students to acquire a positive attitude towards work	12 (52)	8 (35)	3 (13)
Co-op program enables students to find appropriate jobs	3 (13)	18 (78)	3 (13)
Overall evaluation of co-op program	10 (43)	9 (39)	4 (17)

As the number of students in the College continues to increase each year (Table 1), the likelihood of placing all students in the private sector is decreasing. This will no doubt place increasing pressure on College staff to fulfil the co-op requirements for the students in their care.

Supervision Challenges

Student supervision and follow-up activities are resource intensive and are required throughout the semester. At present this is a significant burden (e.g., 18% of the employers and 13% of the College supervisors said the number of visits were not appropriate, and 17% of College supervisors were negative about the mechanism for implementation of the program). To address such issues the

College needs to appoint more staff. However, this is unlikely in the short term due to financial constraints.

College supervisors have teaching duties in addition to their co-op duties. This makes it difficult to balance teaching and supervision; especially since supervision visits are typically constrained by employers' commitments.

Logistical Challenges

In addition to the above-mentioned problems, there were a number of purely logistical difficulties encountered. First, a lack of transport to and from the workplace for both students and College staff. Many students do not have cars and public transport is not readily available in the area where the training takes place. Likewise, lack of transport to

Table 5

Student evaluation of the Riyadh College of Technology cooperative education program (n=141)

Questionnaire Item	Positive (%)	Intermediate (%)	Negative (%)
I found the co-op program met my expectations	68 (48)	62 (44)	11 (8)
I used my time during the co-op program in a useful way	87 (62)	45 (32)	9 (6)
The co-op program provides me the knowledge and skills I need for my future job	97 (69)	31 (22)	13 (9)
Duration of the program was appropriate	101 (72)	14 (10)	26 (18)
Supervision and guidance during the program was appropriate	106 (75)	15 (11)	20 (14)
I would like a job at the same location as my co-op placement	96 (8)	9 (6)	36 (26)

and from the training place for the supervisors, or lack of compensation for the use of private transport.

Lack of financial remuneration for rewards the trainees. Most of the public, and some private organizations, do not provide salaries for the trainees.

Difficulties with conducting the program in the summer (see above), which increases the number of students requiring for placements during the teaching semesters.

Conclusions and Recommendations

Cooperative education is an example of flexible learning that aims to build a bridge between the academic environment and workplace. Many educational institutions worldwide have introduced cooperative education programs, using different ways and means determined by their own material and human resources, the size of organizations and programs, and the ability of the local labor market to provide training support. The Riyadh College of Technology has established a co-op program and has made a genuine attempt to ensure this 'experiment' was carried out according to a clear plan, with clear academic and supervision guidelines.

In this paper, we have examined different characteristics about the College experience in establishing our co-op program. Because of the importance of this experiment we make the following recommendations based on our research findings as reported above.

First, co-op programs require adequate staffing and other material resources. Our study revealed that pressure on resources became evident by means of some problems with achieving high quality supervision and other follow-up activities. Adequate resources are thus necessary to ensure that the student trainee follows any training plan laid down by the College and the workplace.

The success of any 'experiment' in cooperative education cannot be achieved unless a high degree of cooperation between the participants is achieved. Such cooperation must reflect the workplace's clear understanding of cooperative

education concept, the means necessary to implement it and its importance for the trainee and for the workplace. Hence good communication with employers and students about the co-op programs objectives is essential for success of any co-op program.

Arguably, the most important party in the cooperative education is the student. It is important, therefore, that the student trainee gains the maximum benefits from their training. In order to realize this objective, the academic institution must bring the student to a high level of preparedness and ensure that students achieve academically before going on placement. A high level of preparedness plays a big role in convincing students that the training is important for career development, and this will likely have a positive influence on the educational outcomes for the program.

As more and more educational institutions implement co-op programs, coordination between the different educational institutions becomes essential. Such coordination is necessary for the development of these programs in a coherent, non-competitive manner. In addition, it consolidates the cooperation with the workplace, which in turn contributes to the success of these vital programs.

It also is important that co-op practitioners research and explore the positive impact of cooperative education in different aspects - such as its effect on national workforce development, student skills and educational abilities, and other aspects important to this innovative means of learning.

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