

Co-operative Education Programs with IT Companies at Belgrade Metropolitan University

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Abstract - In this paper a description of the cooperative educational program of Belgrade Metropolitan University is described. It implements a parallel co-op model as students simultaneously follow regular courses and work. The BMU Co-op model provides students with paid tuition fees, scholarships and the prospect of a job after graduation. An IT company also has many gains by providing these benefits to students. It can employ a group of graduated IT students each year, specially educated for the company, as these graduated students, its scholars, have four years of work experience in the given company during their studies.

Keywords – Cooperative education, education of IT and software engineering students, internship

I. INTRODUCTION

IT companies these days often have difficulties to recruit new engineers with needed knowledge and skill sets. The demand is high and the offer of fresh graduated students is not sufficient and furthermore, in many cases not in line with requirements of employers. Due to the high demand of IT engineers, many students start working even before completing their studies. This may have a negative impact to their professional development. On the other hand, companies need to provide additional training to these employed students to solve their short-term problems. However, doing this in many cases creates long-term problems, as these programmers usually never complete their studies and have limitations of their capabilities due to poor and uncompleted education.

Having these challenges in mind, Belgrade Metropolitan University (BMU) has developed a parallel cooperative program for students of its bachelor program in Information Technology, Software Engineering, Game Development and Information Systems. Cooperative educative programs are very popular and developed in Canada [1-4] and USA [5-7], but the cooperative program of BMU has some specific features that will be described in the paper.

II. THE CONCEPT OF THE BMU CO-OP PROGRAM

A. Periods of Work and Duration

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Cooperative education is a partnership between a university's academic programs and professional employers who provide off-campus work experience. It is a structured way of learning that combines in-class learning with periods of actual work. There are alternating and parallel co-op models. In the alternating co-op model students alternate a semester of academic coursework with an amount of time working, repeating this cycle several times until graduation (Fig. 1.a). The parallel method splits the day between school and work, typically structured to accommodate the student's class schedule (Fig. 2.b). Surveys and analyses [8-11] have reported many benefits for students that cooperation education can provide.

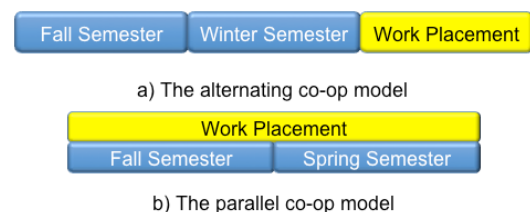


Fig. 1 The alternating and parallel co-op models

The co-operative education program of BMU implements the parallel co-op model. Students follow regular courses having at least 20 in-class hours a week and up to 20 work hours in a company.

During their four-year academic bachelor education, their amount of work in companies is slowly increasing along with their capability to accept more demanding work assignments. During periods of their work, they initially might have more special, short training courses aiming to provide them company-specific know-how (non-formal education), but later they learn more by getting experience in performing their work assignments (informal education), as shown in Fig. 2

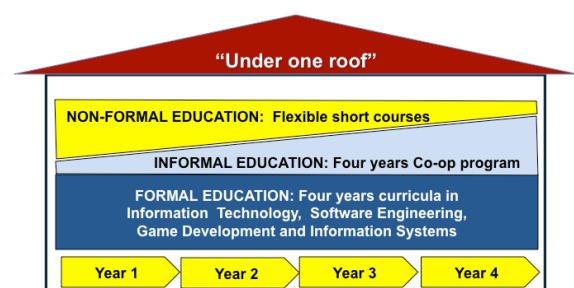


Fig.2 BMU co-operative education model

As students follow academic courses and work simultaneously, it is beneficial if their work placement is as close as possible to the university. At BMU, students study and work in the same building, as its Business and Education Center in Niš (Fig.3) provides the working space to IT companies that participate in the BMU co-op program.



Fig. 3: Business & Education Center of BMU

Having the learning curves of students in mind, BMU co-op programs use different workload distribution of students between academic courses and work terms. Fig.4 shows maximum allowed work of students in a company during a four-year bachelor co-op program. Students may work less, if it is agreed with companies, but not more.

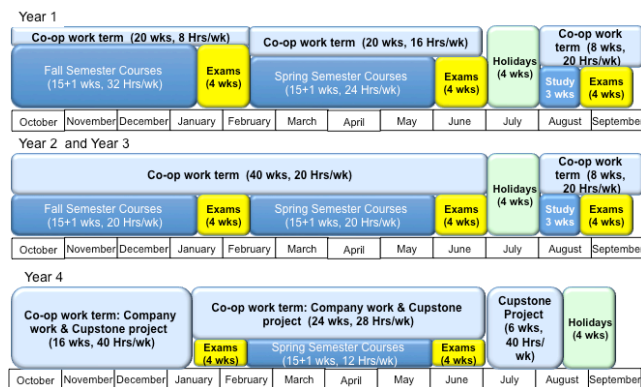


Fig. 4: Workload distribution between work and education for co-op students.

Freshmen students have only 8 hours/week of work in Semester 1 and 16 hours/week in Semester 2. In 2nd and 3rd year, students may work up to 20 hours/week, and in the 4th year they have a full-time work (40 hours/week) in Semester 7 and up to 28 hours/week in Semester 8. The workload distribution of co-op students depends on the company. Table 1 presents two extreme co-op models with a maximum and minimum workload of co-op students during their four years bachelor program. Fig. 5 shows the annual work time of students in case of these two co-op

models. Each company decides about its co-op model. The actual co-op model, in most cases, will have the numbers of work hours of students between these two extremes.

Each company can choose the workload model that suites the company best, but it can be between the two extreme workload models given in Table 1 and Fig. 5. It means that the maximum workload is **24 months** and minimum workload is **12 months** during a period of four years (48 months.)

TABLE I
TWO MODELS OF WORKLOAD OF CO-OP STUDENTS

Sem.	Model No. 1			Model No. 2		
	Weekly Workload (Hrs/wk)	# of work Hrs/wk	Total # of work hours	Weekly Workload (Hrs/wk)	# of work Hrs/wk	Total # of work hours
1	8	20	160	8	15	120
2	16	20	320	8	15	120
Summer 1	20	8	160	0	0	0
YEAR 1			640			240
3	20	20	400	16	15	240
4	20	20	400	16	15	240
Summer 2	20	8	160	0	0	0
YEAR 2			960			480
5	20	20	400	16	15	240
6	20	20	400	16	15	240
Summer 3	20	8	160	0	0	0
YEAR 3			960			480
7	40	16	640	40	15	600
8	28	24	672	16	15	240
Summer 4	40	6	240	0	0	0
YEAR 4			1,552			840
TOTAL			4,112			2,040
Total work months: 24,48				Total work month 12,14		

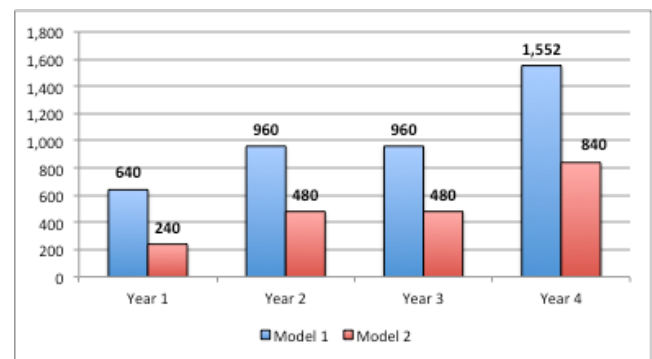


Fig. 5 Maximum and minimum workload of co-op students

BMU co-op partner companies have to provide mentors that work with co-op students and they give them homework and project assignments. Co-op students must submit reports to professors or teaching assistants of each academic course, reporting relevant work they have achieved for each of courses they have in their curriculum.

B. Specifics of the BMU Co-op Education Program

BMU does not require that students find companies (as in Canada, for instance) where they can work during the work terms of the co-op program. BMU makes special arrangement with interested companies and connects students with their companies.

As BMU is a private university and students need to pay tuition fees, it is very important for students to have an option of free education, i.e. to avoid paying tuition fees. Having this in mind, BMU requires that its co-op education business partners pay tuition fees for students that will be their scholars. In return, students have to work in the company during their studies throughout four years, according to the workload model specified by the company and they have to work for the company (if the company asks them) at least four years after the graduation.

It is up to the company to decide the value of their scholarship to be given each month to their scholars during their studies.

For each student, the company, the student and BMU make a contract that specifies the mutual obligations and rights of their participation in the BMU co-op program in detail.

III. RESPONSIBILITIES OF PARTNERS

Each partner has the following responsibilities and obligations:

1. IT Company:
 - a. IT Company offers N scholarships to its scholars (for instance, 30, 85 and 250 EUR/month – for 1st, 2nd and 3rd, and 4th year, separately)
 - b. IT Company pays tuition fees to BMU: 2.000 EUR per year per student
2. Student:
 - a. Partially works for the IT Company and studies
 - b. Must acquire 60 ECTS per year with minimum average grade: 8,00
 - c. Must work for the IT Company for at least 4 years after graduation.
3. BMU:
 - a. Adopts assignments and electives of the scholar to the needs of the IT Company
 - b. Provides needed workspace for the IT Company in BEC building in Niš (free 2m² per scholar, the rest is rental)

IV. FINANCIAL ASPECTS OF THE COOPERATION

IT companies, not only in Serbia, are facing the problem of lacking of IT engineers and programmers these days. The BMU co-operative education program aims to help solving this problem by:

- educating and developing new fresh IT graduates, based on the contract between the university and the

future employer,

- providing parallel work placement of IT students, for at least 12 months during their four years bachelor program.

IT companies, normally, raise few expected questions:

- Are these students useful and can they really contribute to our business before graduation?
- If we have to pay tuition fees for four years, and scholarships to our scholars, is it a cost-effective investment?

The answer to the first question will be provided in next section of this paper, but the answer to the second question is provided here.

Table II shows the cost of a work-hour of a student that is fully covered with the paid tuition fee (2.000 EUR/year) and the scholarship in case of a maximum workload of students (Model 1) and of a minimum workload (Model 2). The level of scholarships depends on the company. Scholarships used in Table II are assumed levels. They depend on students' workload and having in mind that scholarships are not taxed up to 10.600 Din/month (cca 85 EUR/month).

TABLE II

COST OF STUDENTS' WORK IN CASE OF TWO MODELS OF WORKLOAD

Model No. 1 (maximum of student work load)

	Total # of work (Hours)	Net Scholarship (EUR/month)	Gross Scholarship (EUR/month)	Gross Annual Scholarship (EUR)	Annual Tuition Fee (EUR)	Cost of student's work (EUR/hr)
YEAR 1	640	30	30	360	2.000	3,69
YEAR 2	960	85	85	1.020	2.000	3,15
YEAR 3	960	85	85	1.020	2.000	3,15
YEAR 4	1.552	250	286	3.436	2.000	3,50
TOTAL	4.112			5.836	8.000	3,36
Months:	24					

Model No. 2 (minimum work load)

Semester	Total amount of work (Hours)	Net Scholarship (EUR/month)	Gross Scholarship (EUR/month)	Gross Annual Scholarship (EUR)	Annual Tuition Fee (EUR)	Cost of student's work (EUR/hr)
YEAR 1	240	30	30	360	2.000	9,83
YEAR 2	480	85	85	1.020	2.000	6,29
YEAR 3	480	85	85	1.020	2.000	6,29
YEAR 4	840	250	286	3.436	2.000	6,47
TOTAL	2.040			5.836	8.000	6,78
Months:	12					

If a company implements the assumed levels of scholarships, in case of the maximum workload of students (Model 1), the average cost of students' work is **3,36 EUR/hour** (both scholarship and tuition fees are included). In case of a minimum workload of students (Model 2), the average cost is **6,78 EUR/month**.

Table III gives a comparisons of these costs with the cost of work of a junior programmer, employed full-time, having an assumed starting net monthly salary of 600 EUR/month Table III shows that the cost of work of

students during their studies (3,36-6,78 EUR/hour) is lower or comparable with the cost of work of a junior programmer (6,42 EUR/month or more). It means the BMU co-op program offers to IT companies a cost-effective investment in the education of their future IT engineers. If a company has projects and work assignments for its scholars, they can pay-off all investment to their education (tuition fees and scholarships). As IT companies charge the work of junior programmers much more than the cost of work of its scholars, it is realistic to expect that the work of its scholars during their studies even creates some profit to the company.

TABLE III

COST OF STUDENTS' WORK IN CASE OF TWO MODELS OF WORKLOAD

	Model of Work placement with equiv. 1.840 Hrs/yr	Gross Cost per Hour (EUR)	Assumptions
1	Co-op model 1	3,36	if student works 1.840 hrs/yr
2	Co-op model 2	6,78	if student works 1.840 hrs/yr
3	Junior programmer	6,42	for nett salary 600 EUR/mnt

It is fair to mention that in this analysis some cost factors are not included, such as:

- Cost of mentoring of scholars
- Cost of special training courses of scholars
- Cost of learning time of scholars, when they do not work, but learn what they need to know for a task to be assigned to them.

Having the market cost of work of junior programmers in mind, all these cost factors cannot change the general conclusion that the company can earn enough to recover its investment to its scholars, by using them in its projects during their studies. The costs factors given above are usual cost factors that companies have when employing new graduated IT engineers. So, these cost factors are not specific to the co-op program. In case of the co-op program, this cost incurs earlier than normal (when graduated engineers start working for the company).

The cost-effectiveness of a co-op program, that is obviously achievable, is not most important for IT companies. The most important result of the implementation of co-op programs for IT companies is *the solution of the problem of recruiting new IT engineers*. By implementing the proposed co-op program, a company may employ a group of new graduated IT engineers, its former scholars, each year. These engineers are fully effective from the first working day, as they are familiar with the technology and work standards of the company, as they were involved in its projects in previous four years, during their studies.

V. CAN STUDENTS DELIVER WHAT IS EXPECTED?

It is normal to raise this question, when someone has to decide whether to invest in students' education and to include them in some of the company's projects. In order to provide an explicit answer, we will first give some facts related to the curricula of bachelor programs offered to

students at BMU:

- Curricula of programs in Information Technology, Software Engineering, Game Development and Information Systems are fully compliant with the recommendations of IEEE Computer Society, ACM and AIS [12- 15].
- Number of lecture hours and tutorials for most important courses are above usual values.
- BMU implements a modern education methodology where a student plays a very active role working on homework and project assignment every week during each semester.

In order to illustrate what a company can expect from its scholars during their work terms, Table IV shows a list of courses of the two most relevant bachelor programs (Software Engineering and Information Technology). They are fully compliant with IEEE and ACM recommendations [11-13].

TABLE IV

COURSES OF SOFTWARE ENGINEERING AND IT BSC PROGRAMS

S	SOFTWARE ENGINEERING	Hrs /wk	INFORMATION TECHNOLOGY	Hrs/ wk
1	CS101 Intr. to OO Programming	7	CS101 Intr. to OO Programming	7
	CS220 Computer Architecture	6	IT101 IT Fundamentals	5
	MA101 Calculus 1	5	MA103 Mathematics for IT	5
	NT111 English	4	NT111 English	4
2	CS102 Object and Data Abstraction	7	CS102 Object and Data Abstraction	7
	CS323 C/C++ Progr. Language	6	CS323 C/C++ Progr. Language	6
	CS115 Discrete Structures	5	IT210 IT Systems	5
	NT112 English 2	4	NT112 English 2	4
3	CS103 Algorithms and Data Structure	6	IT331 Computer Netw. & Comm.	5
	SE201 Introd. to Software Engineering	7	CS220 Computer Architecture	6
	IT350 Databases	6	IT350 Databases	6
	NT213 English for IT	4	NT213 English for IT	4
4	SE211 Software Construction	6	CS225 Operating Systems	5
	IT370 Human-Computer Interaction	5	IT370 Human-Computer Interaction	5
	IT255 Web Systems 1	6	IT255 Web Systems 1	6
	MA202 Calculus 2	5	CS324 Scripting Languages	6
5	SE321 SW Quality, Testing and Maiten.	6	SE201 Intr. to Software Engineering	7
	SE311 SW Design and Architecture	6	IT335 Computer Sys. & Net. Admi.	5
	SE322 Software Requirements	5	Elective Course 1	
	IT355 Web Systems 2	6	IT355 Web Systems 2	6
6	SE325 Project Mgmnt for SW Devel.	6	SE325 Project Mgmnt for SW Devel.	6
	CS225 Operating Systems	5	IT333 Wireless and Mobile Comm.	5
	Elective Course 1		IT381 Inform. Security and Safety	6
	Elective Course 2		CS330 Development of Mobile Appl.	6
7	Co-op Program (4 months, 8 hrs/day)	40	Co-op program (4 months, 8 hrs/day)	40
	Elective Course 3 (online)	6	Elective Course 2 (online)	
	IT390 Prof. Practice & Ethics (online)	5	IT390 Prof. practice & Ethics (online)	5
	NT310 Prof. Communications (online)	5	NT310 Prof. Communications (onl.)	5
8	IT381 Information Security and Safety	6	Elective Course 3	
	Elective Course 4		Elective Course 4	
	SE495 Cupstone Project		IT495 Cupstone Project	
	ELECTIVE COURSES		ELECTIVE COURSES	
6	CS324 Scripting Languages	6	MA273 Probability and Statistics	5
6	MA273 Probability and Statistics	5	IS250 Arch of Enterprise IT Systems	6
6	CS330 Development of Mobile Appl.	6	CS322 Programming in C#	6
6	IT333 Wireless and Mobile Comm.	5	IS310 Enterprise IS	5
7	IT320 Adv. Technology Platforms	6	IT320 Adv. Technology Platforms	6
7	IS345 Management of Digital Content	6	IS345 Manag. of Digital Content	6
7	IT331 Computer Netw. & Comm.	5	OM350 Entrepreneurship	6
7	CS322 Programming in C#	6	IS330 IS Strategy and Management	6
8	SE401 SW Development Project	5		
8	OM350 Entrepreneurship	6		

After the first year, students should be able to perform simple programming tasks in Java and C++, as they had three programming courses in first two semesters:

- CS101 Introduction to OO programming (7 hrs. /wk.)
- CS102 Object and Data Abstraction (7 hrs. /wk.)
- CS323 C/C++ Programming Language (6 hrs. /wk.)

For each course, students get homework assignments each week and have to realize a project, by developing an application in Java and in C++.

After the second year, Software Engineering students should be able to perform tasks of junior Java or C++ programmers, as they have the following courses:

- CS103 Algorithms and Data Structure (6 hrs. /wk.)
- SE201 Introduction to Software Engineering (7 hrs. /wk.)
- IT350 Databases (6 hrs. /wk.)
- SE211 Software Construction (6 hrs. /wk.)
- IT370 Human-Computer Interaction (5 hrs. /wk.)
- IT255 Web Systems (6 hrs. /wk.)

After completing the Year 3, students are ready for software development projects, as they had all needed software engineering courses:

- SE321 SW Quality, Testing and Maintenance
- SE311 Software Design and Architecture
- SE322 Software Requirements
- SE325 Project Management for SW Development
- Web front-end programming (Web Systems 1) and web back-end programming (Web Systems 2). Besides CS225 Operating Systems, they also have two elective courses in Semester 6.

They have full-time (40 hrs. /wk.) working term in a company, i.e. BMU co-op partner during Semester 7. Besides studying two courses (IT381 Information Security and Safety and a elective course) the main activity in Semester 8 is the SE495 Capstone project. If a student is the scholar of a BMU co-op partner, it is expected that its future employer, BMU co-op partner, would specify its capstone project.

Having the curricula of Software Engineering, Information Technology, Game Development and Information Systems bachelor programs at BMU [11-15] in mind, we are sure that students may perform many programming tasks during their work terms in companies, BMU co-op partners.

VI. THE LEARNING MODEL OF BMU CO-OP

The co-op education includes school-based and work-based learning. When implementing a parallel co-op model, like the BMU co-op model, it is necessary to split the students daily activities between academic courses and work in their companies. Actually, their work should be structured according to their class schedule.

When students follow a traditional, in-class academic program they have at least 20 contact (active) hours a week, or four in-class hours per working day. If the

company does not operate in the same location or near the university, due to travel time of students between the university and company, the available working time, in daily basis is limited to maximum three, in average. One solution of the problem is to schedule courses in such a way that students have two days a week free for their work in companies, and three days when they have courses, with cca seven in-class hours a day, in average. This structuring model of students' activities restricts companies to use students only two days a week. This interruption of their work may disturb their work in company projects, because they normally work in teams with others fully employed team members. If they are completely out of work three days a week, these projects may be seriously affected

An alternative to traditional (in-class) mode of learning is to implement online mode of learning. In this case, co-op students would share their time between their work placement in companies and study activities at home. In this case, co-op students and companies can more easily coordinate their work and learning time. This solution is definitely better for companies, but students have to be highly motivated and well self-organized to successfully realize their on-line courses and learning at home.

BMU co-op model is offering a more appropriate mode of learning, a hybrid or blended learning. Students need to read and learn the content of online lessons, delivered by the e-learning system of BMU at home and come to the university for in-class tutorials and lab work. In this scheduling model, students spend less time at university in classes, in comparison with traditional mode of studying, but still use the benefits of direct communication with their lecturers and teaching assistants during tutorials and lab works. This is a compromise solution that combines good features of all three modes of learning:

- *On-line learning* using provided learning content gives students an opportunity to learn when they are ready for this, and they also learn how to learn alone, which they will need to do during their professional life any way.
- *In-class tutorials and lab work* provide very useful interactions of a student with other students and with lecturers and teaching assistants. This can help them to better acquire new knowledge and skills.
- *Informal learning* during their work in a company, helps a co-op student to learn something that is not normally offered in academic courses, such as technologies and working practices that are specific to the company - their future employer.

The basic features of in-class or face-to-face learning, online (e-learning) and hybrid (blended) learning are different. Fig. 6 and 7 summarize these specific features of the four learning models. We analysed the learning processes taking into account the following features:

- On-line and in-class learning
- Formal, non-formal and informal education
- Full-time and part-time students
- Academic and practical learning content

- Structured and flexible delivery of learning content
- We analysed four learning models:
1. Traditional (in-class or face-to-face)
 2. On-line (e-learning)
 3. Hybrid 1: traditional, but student use e-learning to use learning contents.
 4. Hybrid 2: Student use on-line lessons instead of traditional lectures, and have traditional, in-class tutorials and lab works.

Fig. 6 shows diagrams with typical values of these features in case of traditional (Fig. 6.a) and online education (Fig. 6.b)

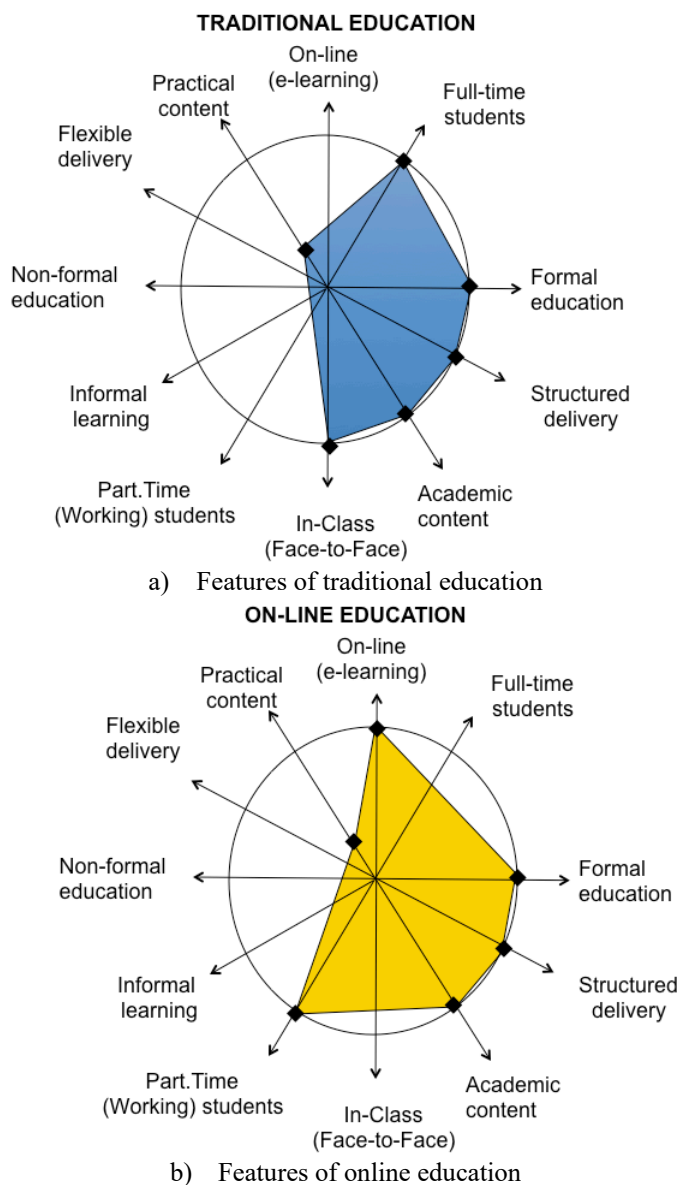


Fig. 6 Typical values of features of traditional and online education

Fig. 7 shows diagrams with typical values of features in case of two hybrid models of education.

BMU is using three of these four education models:

1. **Online Education** – used for working students and students living outside Belgrade and Niš.
2. **Hybrid Education 1** – used in BMU Belgrade campus, where we offer traditional, in-class education, but students use the online content by using our e-learning system.
3. **Hybrid Education 2** – used in BMU Niš campus where we provide in-class tutorials and lab works, and students prepare themselves for tutorials by reading and analysing our online lessons and their learning contents.

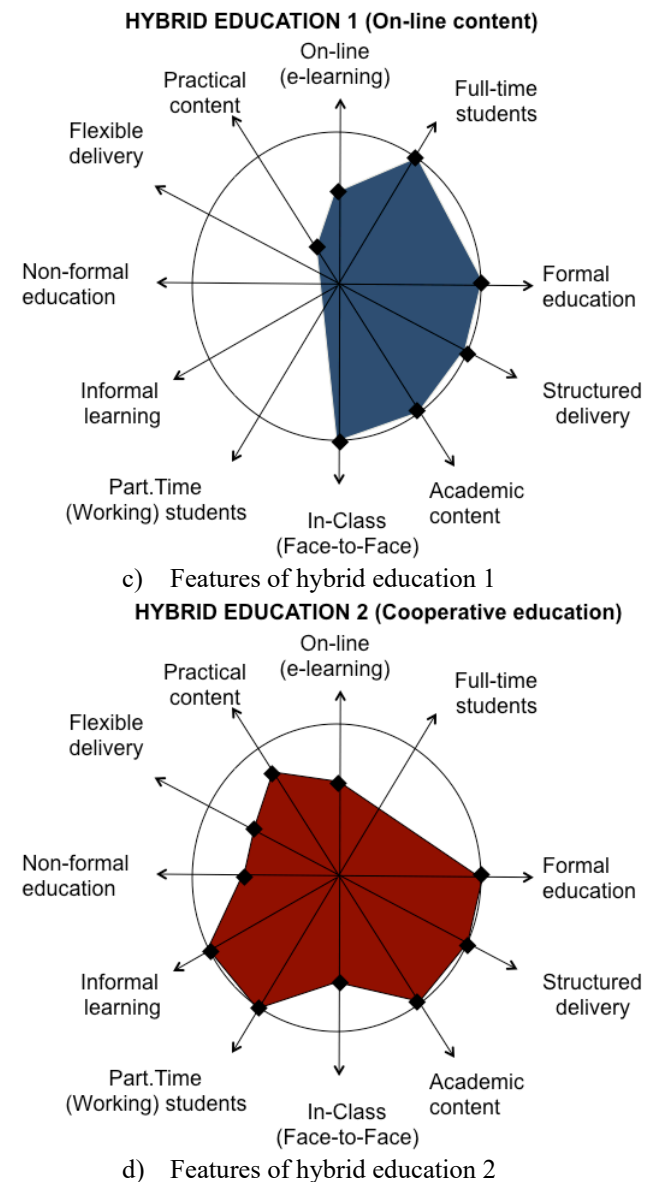


Fig.7 Typical values of features of two hybrid educational models.

Analysing these diagrams, we can notice that the Hybrid Education Model 2 provides the richest set of features, mainly because it includes both informal and non-

formal education, and it provides a flexible delivery of learning contents. These features are missing in traditional education. The implementation of a parallel co-op model, as the BMU co-op model, requires informal and non-formal education and also allows a more flexible scheduling of education and work terms in daily basis. These are the reasons why BMU decided to adopt a parallel co-op model that implements the Hybrid Education Model 2.

VII. HOW DOES THE BMU CO-OP PROGRAM WORK?

Companies interested in the BMU Co-op program should initiate contact with BMU to jointly analyse the specific needs of the company in order to specify the most appropriate Co-op program model.

A. Location

It is necessary to specify where co-op students should work. The best solution is to work in the same building where they are studying. BMU offers the workspace in its Business and Education Center (BEC) in Niš, and the co-op partner may rent the space for its development teams. BMU offers 2 m² of this space free of charge for each co-op student having financial support for its studies from the company. If located in BEC, the company should locate its experienced SW developers or IT staff which will preform its development projects, in which co-op students are also involved as team members there.

If a company prefers that co-op students work in location where the company operates, it is also acceptable by BMU. The only drawback of this solution for the co-op student is the waste of traveling time between BMU location and the company location.

B. Mentors

BMU co-op Partner Company should assign a mentor for each co-op student that will collaborate with the student's mentor from BMU. They will specify homework assignments and project topics for all BMU courses, together with lecturers of these courses. They will also select the most appropriate elective courses from company point of view.

Company mentors should also help co-op students to become familiar with the working practice of the company, and for specifying possible training for students to learn company specific technologies and know-how.

C. Selection of Students

As BMU co-op program covers all eight semesters, it is necessary to select freshmen students interested to be co-op students and scholars of a BMU co-op partner. BMU starts its marketing campaign for enrolment of new students from

October till September following year, for the academic year starting 1st of October. BMU representatives visit about 200 secondary schools promoting its programs and organize many promotional events (such as workshops, free courses) and tournaments, such as "Met Mobile Challenge", "Metropolitan Talents", "It Project of the Year" etc. It is very important to start early promotion of scholarships offered by BMU co-op partner companies (from October at best), in order to attract best secondary school students for enrolment to BMU and for these scholarships. BMU and its co-op partner publish a public call for enrolment of potential students to the co-op program specified for the particular company.

BTU and its co-op partner specify selection criteria for enrolment and scholarships (including paid tuition fees) and a selection procedure. Usually candidates are asked to be tested and to solve some logical problems and programming tasks (based on a given online short training course). The company and BMU representatives then interview successful candidates. The final decision regarding accepting a candidate is on the company.

BMU and its co-op partner company make a contract with each student enrolled in the co-op program specified for the company. The contract specifies all requirements and obligations of all three parties.

- A *student* is obliged to work for the company for at least four years upon graduation, if a job is offered to them. They must acquire 60 ECTS each year and get the average mark 8,00 (of 10.00) or higher. If a student shows poor performance, the company may cease the contract and stop paying the tuition fee and scholarship.
- *The company* normally pays tuition fees for each academic year for the student and specified scholarships. The company should also provide working conditions and project for students during its working time in the company.
- *BMU* takes the responsibility to provide academic courses and to coordinate work assignments of the co-op students with its co-op partner company.

D. Contract Between BMU and its Co-op Partner

BMU prepares and signs a contract with each of its co-op partners, specifying all details regarding their role and obligations in the co-op program specified for each co-op partner. As companies may have different needs and requirements, a specific co-op program is specified for each of them, but based on the general BMU co-op framework program. The contract should specify the amount of scholarships, the number of enrolled scholars for each academic year, terms and conditions for rental of working space (if it is rented) etc.

VIII. BENEFITS TO PROGRAM PARTNERS

Our co-op programs provide the following benefits to

program partners:

IT Company-BMU Co-op Partner:

- Annually employs new graduated IT or software engineers, its scholars, educated according to their needs (in numbers and with appropriate qualifications).
- Return of investment (ROI) in education of its future employees – its scholars - is shorter then their studies. It means that the revenue of the company based on the work of its scholars is higher then the cost of their education (paid tuition fees and scholarships).

Co-op Student – Scholar of the Company gets:

- Free education, as the company pays its tuition fees.
- A scholarship.
- A good job upon graduation
- The best from both formal education (BMU courses) and informal learning (working in a company in parallel with its formal education).

BMU:

- Enrols better students, as it can offer them a good package (free education, scholarship and job upon graduation).

Fig. 8 shows some of these benefits:

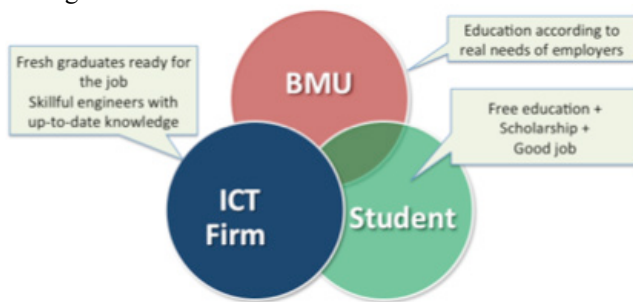


Fig. 8 Some of benefits to partners of the co-op program

VIII. CONCLUSION

The co-operative education program of BMU is based on some specific features (such as simultaneous education and work placement of co-op students) and provides obvious benefits to all three partners (win-win-win):

- A IT company - BMU co-op partner, have a stable annual employment of new graduate IT and software engineers, educated according to its needs by investing in their education according to a cost-effective co-op model.
- A co-op student gets free education (paid tuition fee), a scholarship and a good job upon graduation.
- BMU enrols better students and can implement its mission more easily– to provide a quality education that satisfies the needs of employers.

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