

## **Preparing the Base for Entrepreneurial University: Academic Activities and Directions of Knowledge Transfer at Technical Faculty in Bor – University of Belgrade – Serbia**

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## **Priprea Osnove za Preduzetnički Univerzitet: Akademske Aktivnosti i Pravci Transfera Zn anja na Tehničkom Fakultetu u Boru – Univerziteta u Beogradu**

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**Abstract:** *This manuscript is prepared in form of the report from the Summer Academy, organized by International Resita Network for Entrepreneurship and Innovation (www.resitanet.eu), in Podgorica – Montenegro, on 10-13 September, 2015. The report is presenting some of the activities of the University in Belgrade, as the largest academic institution in Serbia, in development of the adequate conditions for technology transfer and connections between research, industry and SMEs. The activities of the Center for technology transfer are additionally described by its representatives and introduced in the manuscript. Also, some activities of the Technical faculty in Bor, in developing the entrepreneurial way of thinking of young population in the region of Eastern Serbia, are also discussed.*

**Key words:** *Entrepreneurial University, Knowledge Transfer, Entrepreneurial skills*

**Apstrakt:** *Ovaj rukopis je pripremljen u formi izveštaja sa Letnje Akademije, u organizaciji Međunarodne Rešica Mreže za preduzetništvo i Inovacije (www.resitanet.eu), u Podgorici – Crna Gora, od 10 do 13 Septembra, 2015. Izveštaj predstavlja neke od aktivnosti Univerziteta u Beogradu, kao najveće akademske institucije u Srbiji, u razvoju adekvatnih uslova za transfer tehnologije i veze između istraživanja, industrije i malih i srednjih preduzeća (MSP-a). Aktivnosti Centra za transfer tehnologije su dodatno opisane od strane predstavnika ove institucije i predstavljene u rukopisu. Takođe je diskutovano o nekim od*

*aktivnosti Tehničkog fakulteta u Boru u razvoju preduzetničkog načina razmišljanja mladog stanovništva na području Istočne Srbije*

**Ključne reči:** *Preduzetnički Univerzitet, Transfer Znanja, Preduzetničke Veštine*

**JEL Classification:** *I22, I28, M54, O31, O32, O35*

## **I. Introduction**

The mutual relationship between the university and industry through the exchange of knowledge has become a global trend recently (Arvanitis et al., 2008). Many European countries have introduced reforms and policy initiatives to encourage and improve university technology and knowledge transfer (Messeni Petruzzelli, 2011; Rasmussen, 2008; Kalar and Antoncic, 2015). Following these trends, a number of universities have transformed themselves from a traditional research university to an entrepreneurial university with strong relations to industry and SMEs, thereby encouraging and promoting the entrepreneurial activities of their teaching staff (Krabel and Mueller, 2009).

According to different authors, the role of the entrepreneurial university is not simply producing new knowledge, but also disseminating this new knowledge to industry and society (Guerrero et al., 2012, Kalar and Antoncic, 2015). The entrepreneurial university also tries to provide a culture and suitable atmosphere for encouraging academics to disseminate their knowledge through traditional academic activities as well as through activities that are more entrepreneurial in nature (Kirby et al., 2011; Philpott et al., 2011). Also, the entrepreneurial university as a concept, has to be based on many changes to university routines, culture and policies (Tijssen, 2006). Based on these changes, as a result, an entrepreneurial orientation within the university is starting to be formed (Todorovic et al., 2011).

However, In spite of all the initiatives, educational policy modifications and changes and desire to create entrepreneurial universities, there is always a question on how the entrepreneurial orientation within a university may influence academics' willingness for engagement in different new activities (Kalar and Antoncic, 2015). This means that transforming from classical to entrepreneurial university requires engagement of almost all teaching staff,

## **I. Uvod**

Zajednički odnos između univerziteta i industrije kroz razmenu znanja nedavno je postao globalni trend (Arvanitis et al., 2008.). Mnoge Evropske zemlje su uvele reforme i političke inicijative u cilju podsticanja i poboljšanja univerzitetske tehnologije i transfera znanja (Messeni Petruzzelli, 2011; Rasmussen, 2008; Kalar i Antoncic, 2015). Nakon ovih trendova, jedan broj univerziteta se transformisao iz tradicionalnog istraživačkog univerziteta u preduzetnički univerzitet sa jakim vezama sa industrijom i MSP-a, na taj način podstiče i promovše preduzetničke aktivnosti njegovog nastavnog osoblja (Krabel i Mueller, 2009).

U saglasnosti sa različitim autorima uloga univerziteta nije jednostavna proizvodnja novog znanja nego i širenje tog novog znanja u industriji i društvu (Guerrero et al., 2012, Kalar and Antoncic, 2015). Preduzetnički univerzitet takođe pokušava da obezbedi kulturu i odgovarajući ambijent koji podstiče akademike da šire svoja znanja kroz tradicionalne akademske aktivnosti, kao i kroz aktivnosti koje su više preduzetničke u prirodi (Kirby et al., 2011; Philpott et al., 2011). Takođe, preduzetnički univerzitet kao koncept, mora biti zasnovan na mnogim promenama u univerzitetskim navikama, kulture i politike (Tijssen, 2006). Zasnovana na ovom promenama, kao rezultat preduzetnička orijentacija u okviru univerziteta počinje da se formira (Todorovic et al., 2011).

Međutim, i pored svih inicijativa, modifikacija i promena obrazovne politike kao želje da se stvori preduzetnički univerzitet uvek se postavlja i pitanje uticaja preduzetničke orijentacije u okviru univerziteta na akademsku spremnost za angažman u različitim novim aktivnostima (Kalar and Antoncic, 2015). To znači da transformacija iz klasičnog do preduzetničkog univerziteta zahteva angažovanje gotovo svog nastavnog kadra koji treba biti voljan da usvoji

willing to adopt changes in their everyday educational practice. Also, actual involvement in entrepreneurial activities is largely associated with the environment surrounding academics. Namely, research of authors (e.g. Amabile et al., 1996; James and James, 1989) has emphasized that the environment in which an individual works is likely to have a great influence on an individual's behavior. As stressed by D'Este and Patel (2007), the environmental factors mainly influencing an academic's behavior are university culture, policies and routines. In many cases, even at universities operating in countries with highly developed market economies, this can be an obstacle. The lack of entrepreneurial role models, the absence of an entrepreneurial culture across the institution, and the reward system are some of the main barriers in increasing the entrepreneurial patterns of the universities, as described by Philpott et al. (Philpott et al., 2011). This is more evident in case of Serbian academic space, considering that limited resources can be dedicated to university development under the transitional economy.

On the other hand, it should be considered that universities play a vital role for the development of European regions (Guerrero et al., 2014) and that they are instruments for increasing the global competitiveness of the European Union (Guerrero et al., 2015) and the European continent as whole. Accordingly, developing the Entrepreneurial spirit at European academy space is also an important orientation of the European Commission. Through completed FP7 project initiatives, it was realized that most of the European universities were highly theoretical in nature. Most of projects financed in FP7 action, finished with new theories and new knowledge development, however only few had real practical application in the industry as an outcome. Considering that this was not regarded as competitive, in comparison to USA and Japan research society, new project calls in frame of new Horizon 2020 initiative, become much more entrepreneurial in nature. This resulted in defining the new mechanism in the selection phase where one of precognition of accepting the project for financing is that it has to have strong applicability of the research outcome, and direct acceptance in the in-

izmene u svojoj svakodnevnoj nastavnoj praksi. Tajdođe, stvarno učešće u preduzetničkim aktivnostima je u velikoj meri povezano sa akademskim okruženjem. Naime, istraživanja autora (e.g. Amabile et al., 1996; James and James, 1989) je istaklo da okruženje u kojem određeni pojedinac radi po svoj prilici će imati veliki uticaj na ponašanje tog pojedinca. Kao što je naglašeno od strane D'Este and Patel (2007), faktori iz okruženja koji uglavnom utiču na akademsko ponašanje su univerzitetska kultura, politika i navike. U mnogim slučajevima, čak i na univerzitetima koji posluju u zemljama sa visoko razvijenom tržišnom ekonomijom to može biti prepreka. Nedostatak preduzetničkih obrazaca, odsustvo preduzetničke kulture preko institucija i sistema nagrađivanja su neke od glavnih prepreka u povećanju univerzitetskih preduzetničkih obrazaca, kako opisuju Philpott i dr. (Philpott et al., 2011). Ovo je očiglednije u slučaju Srpskog akademskog prostora, s obzirom da ograničeni resursi mogu biti posvećena razvoju univerziteta pod tranzicione ekonomije.

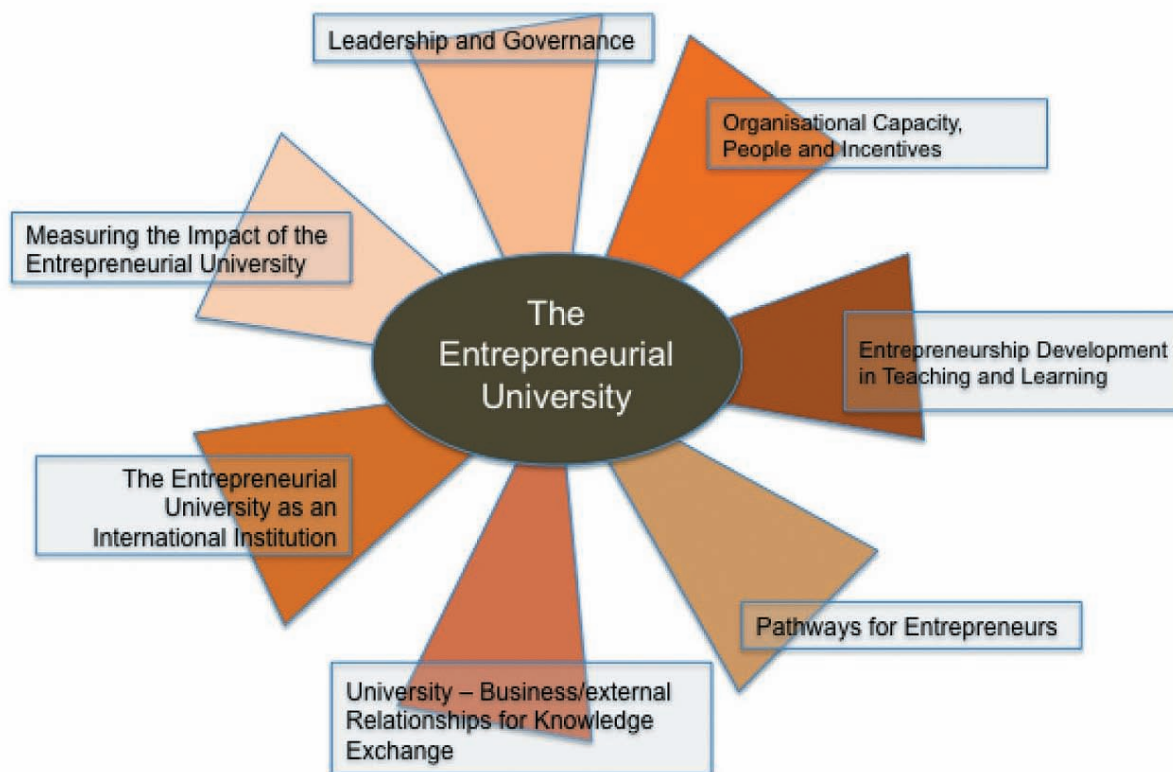
S druge strane, treba imati u vidu da univerziteti igraju vitalnu ulogu za razvoj Evropskih regiona (Guerrero et al., 2014) i da su instrumenti za povećanje globalne konkurentnosti Evropske Unije (Guerrero et al., 2015) i Evropskog kontinenta u celini. Shodno tome, razvoj preduzetničkog duha u Evropskom akademskom prostoru predstavlja takođe važno opredeljenje Evropske komisije. Kroz kompletirane FP7 projektne inicijative je shvaćeno da je većina Evropskih univerziteta bilo visoko teorijske prirode. Većina projekata koji su bili finansirani FP7 zahvatom završeno je sa novim teorijama i razvojem novih znanja dok je samo njih nekolicina imalo kao ishod stvarnu praktičnu primenu u industriji. Imajući u vidu da ovo nije bilo posmatrano kako konkurentnost u poređenju sa istraživačkom zajednicom SAD-a i Japana, novi projektni pozivi u okviru nove HORIZON 2020 inicijative, postaju mnogo više preduzetničke prirode. To je rezultiralo u definisanju novog mehanizma u fazi selekcije gde je jedan od preduslova prihvatanja projekta za finansiranje predstavlja jaka primena istraživačkog rezultata, i di-

dustry. Also, there are new directions in H2020 calls, which are directly based on acceleration of cooperation between universities and industry, Industrial leadership for example (<https://ec.europa.eu/research/>).

The importance of the Entrepreneurial University concept in the European Union is also evidenced by development of 'A Guiding Framework for Entrepreneurial Universities' (EU – OECD document, 2012). The Guiding Framework is aimed at those European universities looking for advice, ideas and inspiration for the effective management of institutional and cultural change. It is designed to help interested universities assess themselves against statements which are organized under the seven areas of Entrepreneurial universities concept, presented in Figure 1.

rektno prihvatanje u industriji. Takođe, postoji i novi pravac u H2020 pozivima, koji se direktno zasniva na ubrzanju saradnje između univerziteta i industrije, Industrijsko vođstvo na primer (<https://ec.europa.eu/research/>).

Značaj koncepta Preduzetničkog Univerziteta u Evropskoj Uniji je takođe evidentan u razvoju „Rukovodećeg Okvira za Preduzetničke Univerzitete“ (EU – OECD document, 2012). Rukovodeći Okvir je bio usmeren na one Evropske univerzitete koji traže savet, ideje i inspiraciju za efikasno upravljanje institucionalnih i kulturnih promena. Dizajniran je da pomogne zainteresovanim univerzitetima da procene sebe prema izjavama koje su grupisane unutar sedam oblasti koncepta Preduzetničkog univerziteta, predstavljenom na Slici 1.



**Figure 1.** Seven factors for assessing the entrepreneurial activities of the universities as defined by EC-OECD

**Slika 1.** Sedam faktora za procenu preduzetničkih aktivnosti univerziteta definisano od strane EC-OECD

The Guiding Framework is further expanding these seven statements into the factors likely to be characteristic of the Entrepreneurial University. Further it is giving the self-assessment tool, based on those seven factors, with the purpose of helping

Rukovodeći Okvir je dalje širio ove sedam izjave u faktore koji će verovatno biti karakteristični za Preduzetničke Univerzitete. Dalje nam daje alat za samoprocenjivanje na osnovu ovih sedam faktora sa ciljem da pomogne univerzitetima da identifikuj-



universities identify their current situation and potential areas of action, taking into account their local and national environments. This is not a benchmarking tool; it is for individual universities to determine their own strengths, weaknesses and find ways forward.

For each of the given statements, a university can assess itself on a scale of 0-10 and then use the Guiding Framework and accompanying material as a way of working on areas where improvement is considered a priority.

This framework was produced under the supervision of the European Commission's DG Education and Culture, in collaboration with the OECD LEED forum, and supported by a panel of six independent experts in this field.

In accordance with the above facts, it can be stated that with the traditional role of education: research and transfer of knowledge are becoming more essential (Wright et al., 2008) all over the world, and subsequently in the European academic space. On the other hand, as universities become more entrepreneurial, several challenges have been identified (Etzkowitz and Leydesdorff, 1996; Etzkowitz and Leydesdorff, 2000; Gibbons et al., 1994). Not only do we still lack a clear definition of what an entrepreneurial university is, but also there is no shared culture among the key actors who must face the challenge of the required shift: the faculty members (Dabić et al, 2015).

Perhaps we do not need a robust theoretical definition; instead, what might serve best is a deeper understanding of what this really entails, according to the key role that universities should play in the current economy (Etzkowitz H. 1998).

Having all the above in mind, the following text is describing some of the attempts of the University of Belgrade, as the largest academic institution in Serbia, in developing strong connections between research and teaching activities, on one hand, and requirements of the industry and SMEs, on the other. Also, some examples of activities targeting developing an entrepreneurial way of thinking, among young population in Eastern Serbia, facilitated by the Technical faculty in Bor, are presented.

ju svoju trenutnu situaciju i potencijalne oblasti delovanja, uzimajući u obzir njihovo lokalno i nacionalno okruženje. Ovo nije benchmarking alat, već služi da pojedinačni univerziteti odrede svoje prednosti, slabosti i pronađu načine za napredovanje.

Za svaku od datih izjava, univerzitet može da se proceni na skali od 0-10, a zatim koristeći Rukovodeći Okvir i prateći materijal kao način rada na područjima gdje se poboljšanje smatra prioritarnim.

Ovaj okvir je napravljen pod nadzorom Evropske Komisije DG Obrazovanja i Kulture, u saradnji sa OECD LEED forumom, i podržan od strane panela od šest nezavisnih stručnjaka iz ove oblasti.

U skladu sa navedenim činjenicama, može se reći da tradicionalna uloga obrazovanja: istraživanje i transfer znanja postaje od suštinskog značaja (Wright et al., 2008) u celom svetu, a zatim i u Evropskom akademskom prostoru. Sa druge strane kako univerziteti postaju više preduzetnički, nekoliko izazova su bila identifikovana (Etzkowitz and Leydesdorff, 1996; Etzkowitz and Leydesdorff, 2000; Gibbons et al., 1994). Ne samo da još uvek nedostaje jasna definicija šta je preduzetnički univerzitet nego ne postoji ni zajednička kultura među ključnim akterima koji moraju da se suoče sa izazovima potrebnih smena: članova fakulteta (Dabić et al, 2015).

Možda nije potrebna robusna teorijska definicija; umesto toga, ono što nam najbolje može poslužiti je dublje razumevanje šta to zapravo iziskuje prema ključnoj ulozi univerziteta koji bi trebao da pliva u tekućoj ekonomiji (Etzkowitz H. 1998).

Imajući sve navedeno u vidu, sledeći tekst opisuje neke od pokušaja Univerziteta u Beogradu, kao najveću akademsku instituciju u Srbiji, u razvoju snažnih veza između istraživačkih i nastavnih aktivnosti sa jedne strane i zahteva industrije i MSP-a sa druge strane. Takođe su predstavljeni neki od primera aktivnosti usmerenih na razvoj preduzetničkog načina razmišljanja među mladom populacijom u Istočnoj Srbiji, potpomognuto od strane Tehnički fakultet u Boru.

## **II. Initiative at the University of Belgrade for Developing the Base for Entrepreneurial University**

The University of Belgrade (UB) is the oldest and the largest university in Serbia with over 89.000 students and 5.000 teachers and associates. According to the Shanghai list, it is ranked among the top 400 universities in the world. The UB comprises 31 faculties, 11 Institutes, 7 Centers and a University library, which all work together on achieving academic excellence. Although being a large academic institution with complex organizational structure can be a limiting factor in the attempt to reposition itself from its traditional role, the University of Belgrade is making continuous efforts in order to contribute to the development of a national innovation system and the creation of an economy and society based on knowledge, transfer of knowledge and entrepreneurial activities.

Considering that establishing, fostering and developing cooperation with other universities, organizations and enterprises all over the world, and strengthening the bonds between them, has been an everlasting commitment of the University of Belgrade, forming of the Center for Technology Transfer (CTT), primarily for the purpose of identification, protection and commercialization of UB's R&D results, was only the next logical step in the direction of preparing the base for evolving into the entrepreneurial university.

Therefore, the importance of investment in the intellectual potential, technology transfer and protection of scientific research results was acknowledged as one of the foremost prerequisites for further successful development in the entrepreneurial direction.

The Center for Technology Transfer plays a supportive role through its promotional, educational and networking activities. It helps students and university employees to recognize the existence of innovation potential, to understand the relevance of its protection, possible ways of commercial exploitation and the complexity of the whole technology transfer process. Also, trainings, seminars, info days, and joint events with the industry representatives are being organized for the purpose of educating targeted groups in the area of

## **II. Inicijativa Univerziteta u Beogradu za razvoj baze preduzetničkog univerziteta**

Univerzitet u Beogradu (UB) je najstariji i najveći univerzitet u Srbiji sa preko 89.000 studenata i 5.000 nastavnika i saradnika. Prema Šangajskoj listi je rangiran među prvih 400 univerziteta u svetu. UB se sastoji od 31 fakulteta, 11 instituta, 7 centralnih i Univerzitetskih biblioteka, što sve radi zajedno na postizanju akademske izvrsnosti. Mada to postajanje velike akademske institucije sa kompleksnom organizacionom strukturom može biti i ograničavajući faktor u pokušaju pozicioniranja od svoje tradicionalne uloge. Univerzitet u Beogradu čini stalne napore kako bi se doprinelo razvoju nacionalnog sistema inovacija i stvaranja ekonomije i društva zasnovanog na znanju, transferu znanja i preduzetničkih aktivnosti.

S obzirom da je uspostavljenje, negovanje i razvijanje saradnje sa drugim univerzitetima, organizacijama i preduzećima širom sveta, i jačanje veze između njih predstavljalo većito opredeljenje Univerziteta u Beogradu, formiranje Centra za transfer tehnologije (CTT), prvenstveno radi identifikacije, zaštite i komercijalizacije Univerzitetskih IR rezultata bio je samo sledeći logičan korak u pravcu pripreme osnove za razvoj u preduzetnički univerzitet.

Stoga, značajna ulaganja u intelektualni potencijal, transfer tehnologije i zaštitu rezultata naučnih istraživanja je potvrđeno kao jedan od najistaknutijih preduslova za dalji uspešan razvoj preduzetničkog pravca.

Centar za Transfer Tehnologije igra podržavajuću ulogu kroz svoje promotivne, edukativne i umrežavajuće aktivnosti. On pomaže studentima i zaposlenima na univerzitetu da prepoznaju postojanje inovacionog potencijala, shvate značaj njegove zaštite, moguće načine komercijalne eksploatacije i složenosti čitavog procesa transfera tehnologije. Takođe, treninzi, seminari, info dana i zajednički događaji sa predstavnicima industrije se organizuju u cilju edukacije ciljne grupe u oblasti preduzetništva, komercijalizacije i prava intelek-

entrepreneurship, commercialization and intellectual property rights. Considering that investments are indispensable precondition for further growth, the Center endeavors to help young researchers to make an excellent pitch and present their idea in the best possible way in order to attract investors. In this respect, there is a permanent strive for creation of start up competitions and matchmaking events, as an opportunity for good ideas to find a way to the market.

The Center's Technology Transfer Managers are creating new and strengthening the existing connections with other universities, organizations and enterprises, through involvement with different associations which promote the Technology Transfer concept, as well as taking part in mentoring programmes with the aim to support future entrepreneurs along their path from the idea up to setting up a business. Basically, they make maximum effort to create an ecosystem which is going to be beneficial for innovational initiative of students, researchers and teachers, simultaneously providing easy access to suitable staff, research projects, technical solutions, and portfolio of inventions needed by industry.

A part of this effort is embodied in the form of 'Science2Business' database, which was created as a response to increasing need for intensification of collaboration between academia and industry, and informing the broader audience about the scientific potential of the University of Belgrade.

The process of technology transfer and the role of the Center are presented in Figure 2.

The database facilitates transfer and implementation of knowledge and technology in favor of prosperity of both sectors and indirectly of sustainable, knowledge based economic development of the country. It enables companies to get the information about new technologies and knowledge easily and efficiently, which is the best way to protect and enhance their competitive advantage in the era of turbulent technological progress.

As a modern communication channel, designed to be a useful service for all involved parties, 'Science2Business' contributes to the generation of their economic

tualne svojine. S obzirom da su investicije neophodan preduslov za dalji rast, Centar nastoji da pomogne mladim istraživačima da naprave odličan teren i predstave svoju ideju na najbolji mogući način kako bi se privukli investitori. U tom pogledu, postoji stalna zalaganja za stvaranje novih „start up“ preduzeća i praćenje konkursa za finansiranje ovih aktivnosti, kao prilika da dobre ideje pronađu put do tržišta.

Menadžeri Centra za Transfer Tehnologije su kreirali nove i ojačali postojeće veze sa drugim univerzitetima, organizacijama i preduzećima kroz uplitanje sa različitim udruženjima koja promovisu koncept Transfera tehnologija, kao i učešće u mentorskim programima sa ciljem da se podrže budući preduzetnici u svom putu od ideje do pokretanje biznisa.

U suštini, oni čine maksimalne napore da stvore ekosistem koji će biti od koristi za inovacionu inicijativu studenata, istraživača i nastavnika, istovremeno pružajući jednostavan pristup odgovarajućeg kadra, istraživačkih projekata, tehničkih rešenja, i portfolio pronalazaka koji su potrebni industriji.

Jedan deo ovog napora je oličen u formi baze podataka "Nauka 2 Biznis", koji je nastao kao odgovor na rastuću potrebu za intenziviranje saradnje između akademije i industrije, i informisanje šire javnosti o naučnom potencijalu Univerziteta u Beogradu.

Proces transfera tehnologije i uloga Centra su prikazani na Slici 2.

Baza olakšava transfer i primenu znanja i tehnologija u korist prosperiteta oba sektora i indirektno održivih, zasnovanom na znanju ekonomskom razvoju zemlje. To omogućava kompanijama da dobiju informacije o novim tehnologijama i znanjima lako i efikasno, što je najbolji način da se zaštite i unaprede svoju konkurentsku prednost u eri burnog tehnološkog napretka.

Kao modern komunikacioni kanal, dizajniran je da bude koristan servis za sve uključene strane, "Nauka2Biznis" doprinosi stvaranju ekonomskih koristi kroz zajed-

## Technology transfer process

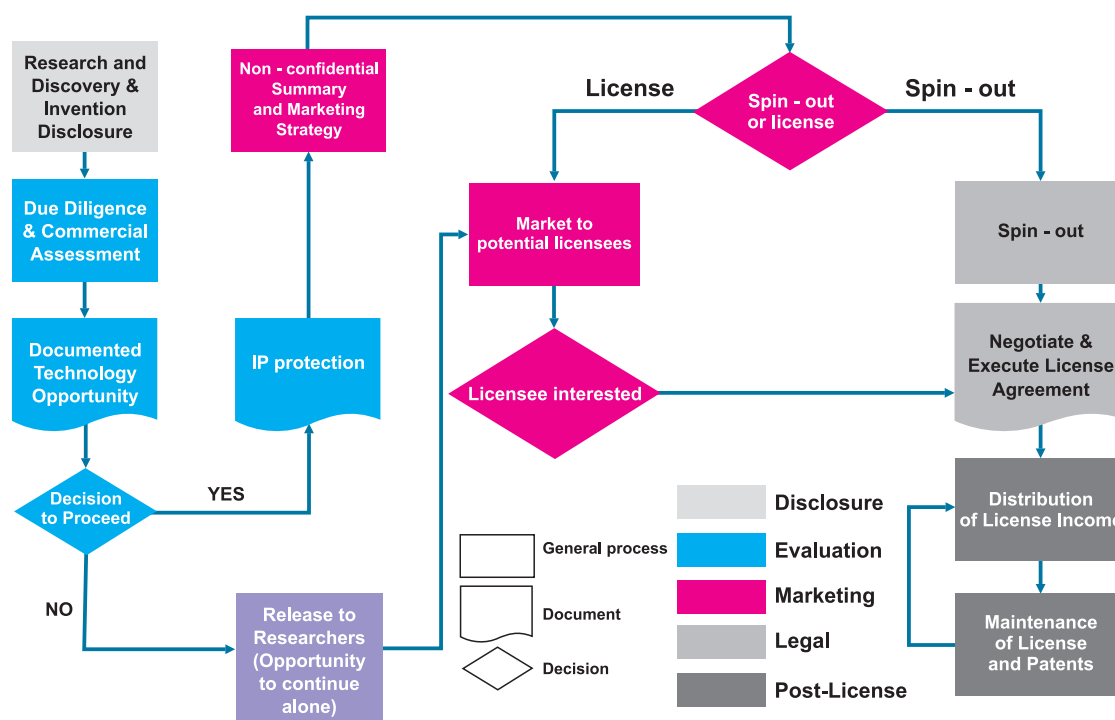


Figure 2. The process of technology transfer at the UB (<http://www.ctt.bg.ac.rs/>)

Slika 2. Proces transfera tehnologije na UB-u (<http://www.ctt.bg.ac.rs/>)

benefits through joint research activities, development of new and improvement of the existing products, joint participation in national and international projects and business idea creation.

Although it is still in a developing phase, establishing the Center for technology transfer in the scope of the University is a clear indicator of its decisiveness to initiate and encourage entrepreneurial spirit within itself. Taking all the above into consideration, the Center has achieved remarkable results creating entrepreneurial and innovation friendly environment through its numerous activities in that field and it is eager to continue in the same direction in the future.

### 2.1. Initiatives of the Technical Faculty in Bor for Increasing the Entrepreneurial Spirit of Youth

The Technical Faculty (TF) in Bor was established in the year 1961 as a part of the University of Belgrade as a scientific-research organization in the area of technical-technological science. The main activities on TF Bor could be divided into two groups. The first is focused on provid-

ničke istraživačke aktivnosti, razvoj novih i unapređenje postojećih proizvoda, zajedničko učešće u nacionalnim i međunarodnim projektima i stvaranju poslovnih ideja.

Iako je još uvek u fazi razvoja, uspostavljenje Centra za Transfer Tehnologije u okviru Univerziteta je jasan pokazatelj njegove odlučnosti da inicira i podstiče preduzetnički duh u sebi. Uzimajući u obzir sve gore navedeno, Centar je napravio zavidne rezultate kreiranje preduzetničkog i inovaciono prijateljskog okruženje kroz brojne aktivnosti u toj oblasti i da je željan da nastavi istim pravcem u budućnosti.

#### 2.1. Inicijative Tehničkog fakulteta u Boru u povećanju preduzetničkog duha mladih

Tehnički fakultet (TF) u Boru osnovan je 1961. godine kao deo Univerziteta u Beogradu kao naučno-istraživačka organizacija u oblasti tehničko-tehnoloških nauka. Glavne aktivnosti na TF Bor mogu se podeliti u dve grupe. Prva se fokusira na pružanje najvišeg mogućeg nivoa akademskih studija mogućih, u cilju snabdevanja studenata važećim znanjema, teh-



ing the highest level of academic studies possible, in order to provide the students with the applicable knowledge, technical and managerial skills, which are required by business organizations. Academic studies are organized for approximately 1,400 students at BSc, MSc and PhD level. Second group of activities are projects in which our scientific staff is engaged.

The Technical faculty in Bor is active in publishing, being the publisher of two International Scientific Journals: Journal of Mining and Metallurgy, Section B: Metallurgy (indexed on Thompson Reuters List) [www.jmmab.com](http://www.jmmab.com) and Serbian Journal of Management (indexed by EBSCO Publishing and SCOPUS) [www.sjm06.com](http://www.sjm06.com).

The Faculty employs following teaching staff: 14 Professors, 14 Associate professors, 20 Senior lecturers, 4 lecturers, 32 Teaching assistants. Non-teaching staff: 1 legal secretary, 3 administrators at the Faculty computer centre, 3 book keepers, 5 student affairs administrators, 7 financial services administrators, 24 maintenance, service and laboratory staff, and accordingly can be described as small one. There are following divisions at the Faculty:

- *The Division for management*
  - Department for engineering management
- *The Division for Inorganic chemical technology*
  - Department for chemistry and chemical technology
  - Department for Engineering and environment protection
- *The Division for metallurgy*
  - Department for Metallurgical engineering
  - Department for Processing metallurgy
- *The division for mining*
  - Department for Underground exploiting of mineral deposits
  - Department for open pit mining of mineral deposits
  - Department for Mineral and recycling technologies

The Technical faculty in Bor, is a member of the University of Belgrade (UB), together with 30 other faculties. However, TF Bor, has one specific feature. It is the only one of 31 UB faculties, which is located outside

ničkim i menadžerskim veštinama, koje su potrebne u poslovnim organizacijama. Akademske studije organizuju se za oko 1.400 studenata na osnovnim, master i doktorskim studijama. Druga grupa aktivnosti čine projekti u kojima je naučni kadar angažovan.

Takođe, Tehnički fakultet u Boru je aktivan u izdavaštvu, kao izdavač dve Međunarodna Naučna Časopisa: Journal of Mining and Metallurgy, Section B: Metallurgy (indexed on Thompson Reuters List) [www.jmmab.com](http://www.jmmab.com) i Serbian Journal of Management (indexed by EBSCO Publishing and SCOPUS) [www.sjm06.com](http://www.sjm06.com).

Fakultet zapošljava sledeće nastavno osoblje: 14 redovnih profesora, 14 vanrednih profesora, 20 docenata, 4 predavača, 32 asistenti. Ne-nastavno osoblje: 1 pravni sekretar, 3 administratori u kompjuterskom centru fakulteta, 3 bibliotekara, 5 administratora za studentska pitanja, 7 finansijskih administratora, 24 zapošljenih na održavanju, servisu i laboratorijskog osoblja, i shodno tome može se opisati kao jedan od manjih.

Fakultet:

- *Odsek za menadžment*
  - Katedra za inženjerski menadžment
- *Odsek za tehnološko inženjerstvo*
  - Katedra za hemiju i hemijsku tehnologiju
  - Katedra za inženjerstvo zaštite životne sredine
- *Odsek za metalurgiju*
  - Katedra za Metalursko inženjerstvo
  - Katedra za prerađivačku metalurgiju
- *Odsek za rudarstvo*
  - Katedra za Podzemnu eksploataciju ležišta mineralnih sirovina
  - Katedra za Površinsku eksploataciju ležišta mineralnih sirovina
  - Katedra za Mineralne i reciklažne tehnologije

Tehnički fakultet u Boru, je član Univerziteta u Beogradu (UB), zajedno sa 30 drugih fakulteta. Međutim, TF Bor, ima jednu posebnost. On je jedini fakultet UB koji se nalazi van Beograda i smešten je u Istoč-

Belgrade, being located in Eastern Serbia, in the city of Bor, which is 250 km away from the Serbian capital. There is a strong reason for this. The city of Bor is one of the largest copper producing centers in Europe. For more than one century copper ore has been mined and extracted there in the mining and metallurgical company RTB – Bor. Thus, the TF Bor, is developed to sustain this industry and to educate engineers which will be employed in this large company.

Such situation has many positive, but also some negative, consequences. The positive consequences are in the fact that TF Bor is strongly connected with the industry since the beginning. There are many places for experimental work and practice of our students, which have direct links to the industry of the RTB Bor Company. Also, the development of the study programs at TF Bor was largely influenced by the requirement of the company. On the other hand, the negative consequences of this situation reflect the low development of entrepreneurial initiative in the region of the city of Bor. The reason for this should be found in the fact, that in the past, most of the high school and university graduates from this region were automatically employed in the RTB Bor Company. Sometimes, students were employed in their final years, because of expansions of the company. Accordingly, nobody even thought about the possibility to start their own business in those days. However, during the nineties, the economic situation in Serbia largely changed, leading to a decrease of the RTB Bor Company capacities and resulting in downsizing. Instantly, the region faced a large number of laid off employees and decrease of employability of newly graduated students. This was a wakeup call to start thinking about entrepreneurial activities as the alternative to the large industry of this region. Accordingly, TF Bor gained its primary role again in responding to the needs of the region, and 13 years ago developed the Management department, with one of the goals to offer the entrepreneurial skills and knowledge to its management students. Entrepreneurial disciplines are among the main courses included in the Engineering Management Department (EMD) curriculum

noj Srbiji, u gradu Boru, koji je udaljen 250 km od glavnog grada Srbije. Postoji jaka razlog za to. Grad Bor je jedan od najvećih centara za proizvodnju bakra u Evropi. Ruda bakra se više od jednog veka kopa i prerađuje u rudarsko metalurškoj kompaniji RTB-Bor. Te je TF Bor osnovan da podrži ovu industriju i obrazuje inženjere koji će biti zaposleni u ovoj velikoj kompaniji.

Takva situacija ima mnogo pozitivnih ali i neke negativne posledice. Pozitivne posledice su u činjenici da TF Bor je snažno povezan sa industrijom od samog početka. Postoji mnogo mesta za eksperimentalni rad i praksu studenata, koja ima direktne veze sa industrijom RTB Bor kompanije. Takođe, razvoj studijskih programa na TF Bor je u velikoj meri pod uticajem zahteva društva. S druge strane, negativne posledice ove situacije odražavaju se niskim razvojem preduzetničke inicijative u regionu grada Bora. Razlog za to treba tražiti u činjenici da u prošlosti, većina srednjoškolarca i diplomiranih studenata iz ovog regiona su se automatski zapošljavali u kompaniji RTB Bor. Ponekad su se studenti zapošljavali na svojim završnim godinama zbog proširenja kompanije. Shodno tome, niko nije ni razmišljao o mogućnosti da započne sopstveni biznis u tim danima. Međutim, tokom devedesetih godina ekonomska situacija u Srbiji se u velikoj meri promenila, što dovodi do smanjenja kapaciteta kompanije RTB Bor koja za rezultat ima smanjenje. Region se odmah suočio sa velikim brojem nezaposlenih i smanjenje zapošljivosti novo diplomiranih studenata. Ovo je bio poziv za buđenje početnih razmišljanja o preduzetničkim aktivnostima kao alternativu velikoj industriji ovog regiona. Shodno tome, TF Bor je dobiti svoju prvenstvenu ulogu ponovo u odgovoru na potrebe regiona, gde je pre 13 godina razvio Odsek za menadžment, sa jednim od ciljeva da ponudi preduzetničke veštine i znanja svojim studentima menadžmenta. Preduzetnički discipline se nalaze među glavnim kursevima nastavnog plana i programa Odseka za Inženjerski Menadžment (EMD) (<http://menadzment.tf.bor.ac.rs/english/curriculum/>).

(<http://menadzment.tf.bor.ac.rs/english/curriculum/> ).

However, at TFB it was realized that it was not enough. It was realized that the most important issue is the development of 'entrepreneurial spirit' among younger population (high school and elementary school students) of the region of Eastern Serbia, where TFB is located, which will lead to a change toward entrepreneurial DNA (Abraham, 2011). Development of the entrepreneurial spirit, in the young population of the region, will at the same time lead to creating the new jobs by self-employment. Accordingly, Engineering Management Department (EMD) of TF Bor, UB, started its campaign and engagement in the projects dedicated to increasing the entrepreneurial potential among young people of the region.

One of the first action in this direction was connecting with Hewlett Packard (HP) LIFE program for promotion of entrepreneurial way of thinking among high school students and potential entrepreneurs, using the everyday ICT technology with which this target group is familiar. The goal of this program is achieved through development of entrepreneurial spirit, working on entrepreneurial ideas and sustaining the ideas with adequate knowledge from the field of business, as well as the field of information and communication technologies (ICT). Education according the HP LIFE program is organized in 49 countries around the world. The Technical faculty in Bor is the only accredited partner of this program in Serbia (<http://www.life-global.org/en/EDUCATORS/Educator-network>). The program was originally developed as the GET IT project, managed by Micro Enterprise Acceleration Institute - MEA I (Switzerland). Since the early beginning of this program was in 2008, when MEA-I and HP developed the GET-IT project, the Technical faculty in Bor was actively involved. As a participating organization, the Technical faculty in Bor, received a grant of HP equipment, the T-Tools Guidance course for their trainers and the T-Tools training materials.

The LIFE Program trainings are based on integration of Business Skills Courses and Technology Courses, this way resulting in

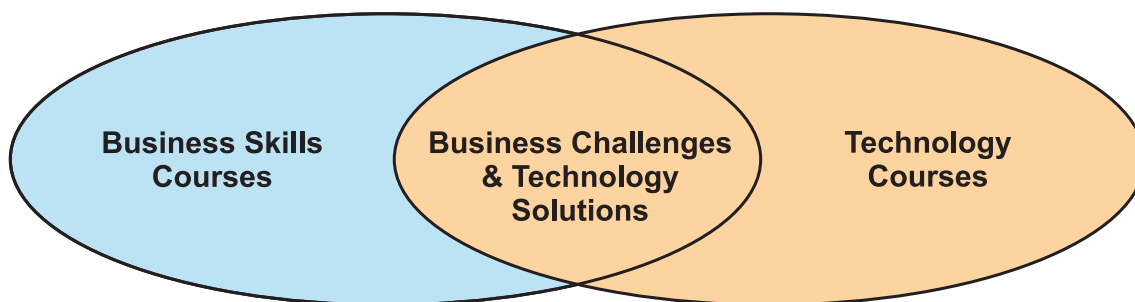
Međutim, na TFB-u je bilo shvaćeno da to nije dovoljno. Shvaćeno je, da je najvažnije pitanje razvoj „preduzetničkog duha“ među mlađom populacijom (srednjoškolicima i učenicima osnovnih škola) regiona Istočne Srbije gde je TFB smešten, što će dovesti do promena u pravcu preduzetničke DNK (Abraham, 2011). Razvoj preduzetničkog duha mlade populacije regiona će istovremeno dovesti do stvaranja novih radnih mesta samozapošljavanjem. Shodno tome, Katedra za Inženjerski Menadžment (EMD) TF Boru otpočela je svoju kampanju i angažovanje na projektima posvećenim povećanju preduzetničkog potencijala među mladima u regionu.

Jedna od prvih radnji u tom pravcu bilo je povezivanje sa Hewlett Packard (HP) LIFE programom za promociju preduzetničkog načina razmišljanja među srednjoškolicima i potencijalnim preduzetnicima, koristeći svakodnevni IKT tehnologije sa kojom je ova ciljna grupa upoznata. Cilj ovog programa ostvaruje se kroz razvoj preduzetničkog duha, radu na preduzetničkim ideja i podržavanju ideja adekvatnim znanjem iz oblasti biznisa, kao i u oblasti informaciono komunikacionih tehnologija (IKT). Obrazovanje u skladu sa HP LIFE programom je organizovan u 49 zemalja širom sveta. Tehnički fakultet u Boru je jedini akreditovan partner ovog programa u Srbiji (<http://www.life-global.org/en/EDUCATORS/Educator-network>). Program je prvobitno razvijen kao GET IT projekat, kojim rukovodi Micro Enterprise Acceleration Institute - MEA I (Svajcarska). Tehnički fakultet u Boru je bio aktivno uključen od samog početka ovog programa 2008., kada su MEA-I i HP razvili GET-IT projekat. Kao učestvujuća organizacija, Tehnički fakultet u Boru je dobio donaciju od HP opreme, praktikum pod nazivom T-Alati za vođenja kursa za instruktore kao i materijal za obuku polaznika.

LIFE program obuke je zasnovan na integraciji Kurseva Poslovnih Veština i Tehnoloških kurseva, ovaj način rezultuje Poslovne Izazove i Tehnološka Rešenja, kao što je prikazano na slici 3 (<http://www.life-global.org/>). Postoje razlozi za ovakva nastojanja u razvoju preduzetničkog duha među mladom populacijom zasnovanom

Business Challenges and Technology Solutions, as presented in Figure 3 (<http://www.life-global.org/>). There is a reason for this attempt in development of entrepreneurial spirit among young population based on ICT. Today almost all high school and university students do have access to PCs, mobile phones and other ICT de-

na IKT. Danas gotovo svi srednjoškolski i studenti imaju pristup računarima, mobilnim telefonima i drugim IKT uređajima. Nažalost, u većini slučajeva, oni koriste ovu opremu za ličnu zabavu. Svrha ovog obrazovanja je da ih nauči da koristi istu tehnologiju u poslovne i preduzetničke aktivnosti (Mihajlovic et al., 2012).



**Figure 3.** Finding the solutions to business challenges based on technology

**Slika 3.** Pronalaženje rešenja za poslovne izazove na osnovu tehnologije

vices. Unfortunately in most cases, they use this equipment for personal entertainment. The Purpose of this education is to teach them to use the same technology in business and entrepreneurial activities (Mihajlovic et al., 2012).

This means that none of the technology courses in the LIFE Curriculum is taught just for technology's sake. Rather, the technology covered here is applied to business to show how common, widely available ICT tools can help solve common, widely encountered business challenges – all with the goal of helping businesses run more smoothly and grow more quickly.

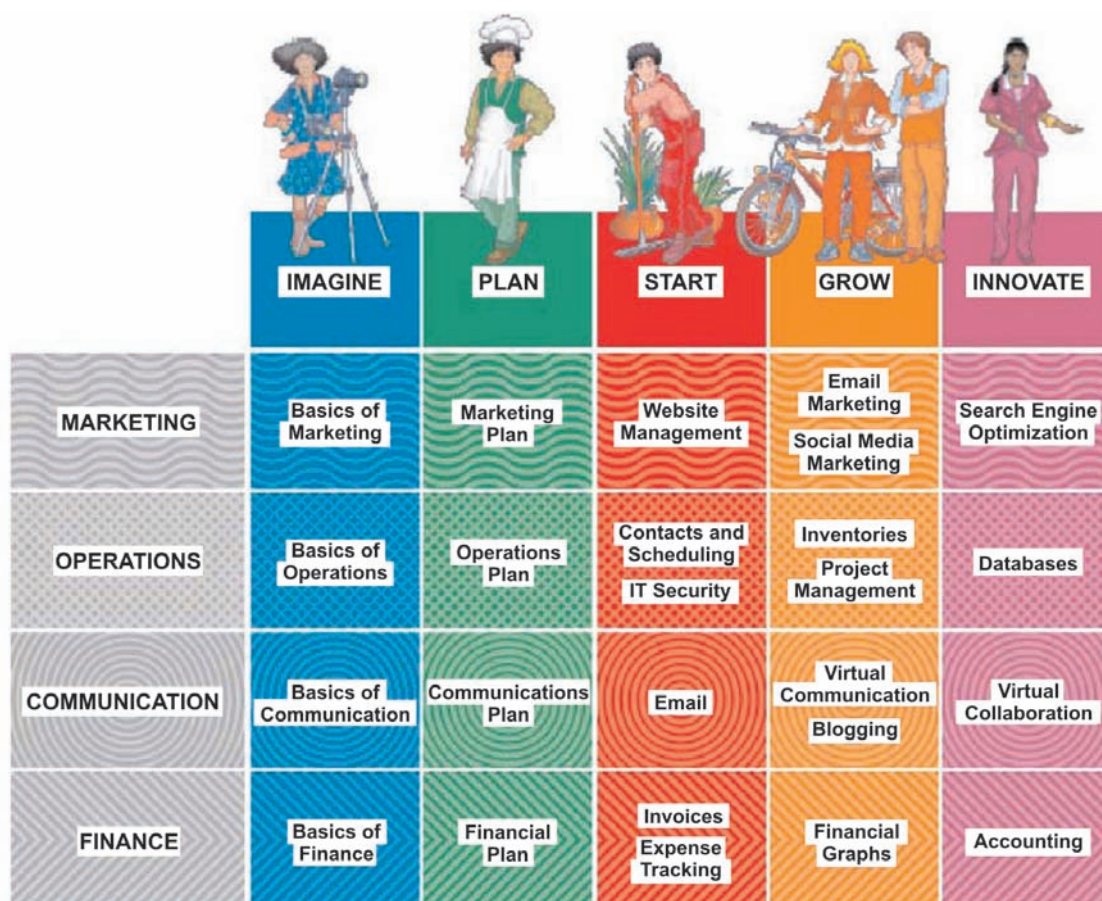
The training is organized around the concept of workshops with interactive approach to the subjects presented and using a contemporary methodological concept. The four modules which are included in the training, according to HP LIFE program are: Marketing, Operations, Communication and Finance (Figure 4). Each of the modules is further developed in five segments: Imagine Plan, Start, Grow and Innovate. This way, the curriculum includes  $4 \times 5 = 20$  subjects. Each subject is worked out separately through an adequate methodological approach. Also, adequate modules levels are chosen for the level of prior knowledge of the high school or the faculty students.

To znači da nijedan od tehnologije pokrivena LIFE planu i programu se uči samo zbog tehnološke koristi. Umesto toga, ovde pokrivena tehnologija se primenjuje na poslu da pokaže kako obični, široko dostupni IKT alati mogu pomoći u rešavanju zajedničkih, široko susrećuće poslovne izazove - a sve sa ciljem da se pomogne preduzećima da bolje radite i brže rastu.

Obuka je organizovana putem radionica sa interaktivnim pristupom predstavljenih predmeta i koristi savremeni metodološki koncept. Četiri modula koji su uključeni u obuku, prema HP LIFE programu su: marketing, operacije, komunikacije i finansije (slika 4). Svaki od modula se dalje razvija u pet segmenata: Zamisliti, Planirati, Započeti, Rasti i Inovirati. Na ovaj način, nastavni plan i program obuhvata  $4 \times 5 = 20$  predmeta. Svaki predmet se radi odvojeno kroz adekvatan metodološki pristup. Takođe, odgovarajući modulni nivoi su odabrani za odgovarajući nivo prethodnog znanja srednjoškolaca i studenata.

Obuka je organizovana za grupe od po 10 do 20 polaznika u računarskim sobama opremljenim sa 10 Personalnim računarima (PCs). Softver potrebna za obuku obezbeđen je od strane HP LIFE programa, međutim, većina aplikacija su zasnovane na otvorenim izvorima i dostupne su jav-





**Figure 4.** Modules of the HP LIFE program which are included in TFB curriculum

**Slika 4.** Moduli HP LIFE programa koji su uključeni u nastavni plan i program TFB-a

The training is organized for groups with 10 to 20 attendants in computer rooms equipped with at least 10 Personal computers (PCs). Software required for the trainings is provided by the HP LIFE program, however most of the applications are based on the open source and publicly available programmes. Each modules subject is based on a different ICT application. Trainings for one group of students are 5 days long (15 to 20 hours in total).

**IMAGINE** is the first level of the LIFE Curriculum. IMAGINE addresses people who have no background in business and who are still only dreaming of setting up their own enterprise. IMAGINE offers them training on business concepts, helping them build the foundations of their entrepreneurial thinking. IMAGINE teaches them different types of business analyses while at the same time introducing them to basic technologies that can be used to build these analyses in a professional manner.

**PLAN** is the second level of the LIFE Curriculum. PLAN addresses people who do

nosti. Svaki modulni predmet zasnovan je na različitoj primeni IKT. Obuka za grupu učenika je 5 dana duga (15 do 20 sati ukupno).

**ZAMISLITI** je prvi nivo LIFE nastavnog plana i programa. ZAMISLITI se obraća ljudima koji još uvek nemaju iskustva u poslovanju i koji još uvek samo sanjaju o osnivanju sopstениh preduzeća. ZAMISLITI nudi im obuku o poslovnim konceptima, pomažući im da izgrade temelje njihovog preduzetničkog razmišljanja. ZAMISLITI uči ih raznih vrsta poslovne analize, a istovremeno ih upoznaje sa osnovnim tehnologijama koje se mogu koristiti za izradu ovih analiza na profesionalan način.

**PLANIRATI** je drugi nivo LIFE nastavnog plana i programa. PLANIRATI se obraća ljudima koji još uvek nemaju svoje preduzeće ali koji imaju dobro razumevanje osnovnog poslovnog koncepta i ideju posla koji bi želeli da započnu. On ih uči kako da prevedu svoje ideje u dobro istražen i strukturiran Biznis Plan. PLANIRATI nam

not have their own company yet, but who have a good grasp on fundamental business concepts and an idea of the business they would like to start. It teaches them how to translate their idea into a well-researched and structured Business Plan. PLAN introduces further features of the same technological tools covered in the IMAGINE level, giving students the skills necessary to build a flexible and presentable Business Plan.

**START** is the third level of the LIFE Curriculum. START addresses potential beginners in business to help them develop their basic ICT skills so they can run their company as effectively as possible from the very beginning. The START level of the Curriculum is equally applicable to more established micro-enterprise owners who have considerable business experience but who are not in the habit of using information and communication technologies to manage and run their company.

**GROW** is the fourth level of the LIFE Curriculum. GROW focuses on more advanced technology for business skills and gives the advanced students the chance to learn about more complex technologies. The content of the GROW level of the Curriculum builds on the skills acquired in the START level, introducing more advanced features of certain technologies as well as entirely new solutions, many of which include Web 2.0 components.

**INNOVATE** is the fifth level of the LIFE Curriculum. INNOVATE addresses future entrepreneurs who are looking to optimize their operational tasks by undergoing training on more sophisticated technologies for business. INNOVATE builds on the technologies covered in the previous levels of the Curriculum to give potential entrepreneurs who are knowledgeable in business and skilled in technology the opportunity to learn how complex applications can be integrated to help them take their business one step further.

The LIFE Curriculum teaching methodology, described in the next few paragraphs, was designed for business oriented young and adult learners. There are two key pedagogical concepts that underpin this methodology: the Experiential Learning Cycle and the Business-Technology-Business framework.

predstavlja dodatne karakteristike istih tehnoloških alata predstavljenih u ZAMISLITI nivou, davajući studentima potrebne veštine za izgradnju fleksibilnog i reprezentativnog Biznis Plana.

**ZAPOČETI** je treći nivo LIFE nastavnog plana i programa. ZAPOČETI se bavi potencijalnim početnicima u biznisu kako bi im pomogao da razviju svoje osnovne IKT veštine kako bi mogli da vode svoju firmu što efikasnije moguće od samog početka. START nivo nastavnog plana i programa se odnosi više na vlasnike osnovanih mikro-preduzeća koji imaju značajno poslovno iskustvo, ali koji nemaju naviku korišćenja informacionih i komunikacionih tehnologija za upravljanje i vođenje svoje kompanije.

**RASTI** je četvrti nivo LIFE nastavnog plana i programa. RASTI se fokusira na naprednije tehnologije za poslovne sposobnosti i daje naprednim studentima priliku da se upoznaju sa složenijim tehnologijama. Sadržaj nastavnog plana i programa na nivou RASTI je zasnovan na veštinama stečenim na nivou ZAPOČETI, uvođenjem napredne funkcije pojedinih tehnologija, kao i potpuno nova rešenja, od kojih mnoga uključuju Vab 2.0 komponente.

**INOVIRATI** je peti nivo LIFE nastavnog plana i programa. INOVIRATI obraća se budućim preduzetnicima koji žele da optimizuju svoje operativne zadatke na obuci putem sofisticiranih tehnologija za poslovanje. INNOVATE se nadograđuje na tehnologijama koje su obrađene u prethodnim nivoima nastavnog plana i programa da bi potencijalne preduzetnike koji imaju dovoljno znanja i tehnološke veštine dobiju priliku da nauče kako kompleksne aplikacije mogu biti integrisane u razvoju poslovanja za korak više.

Metodologija LIFE nastavnog plana i programa opisana u narednih nekoliko pasusa je poslovno orijentisana na mlade i stare učenike. Postoje dva ključna pedagoški koncepti koji naglašavaju ovu metodologiju: Ciklus Iskustvenog Učenja i Biznis-Tehnologija-Biznis okvir.

### EXPERIENTIAL LEARNING CYCLE:

The Experiential Learning Cycle is a way of learning through experience (Figure 5). Research has shown that young adults and adults learn best in a hands-on activity way. The cycle works as follows: Every topic in the LIFE Curriculum begins with students acquiring some new theoretical information. Then, students process that information through a practical exercise – in other words, a hands-on experience. After that, students reflect on what they learned and discuss how they might apply and consolidate their newly acquired knowledge. Then, they go into the real world and apply what they have learned. After that, the cycle can commence again: having acquired experience and assessed their needs further, students are ready to gain new practical knowledge that they can apply to their future business.

### CIKLUS ISKUSTVENOG UČENJA:

Ciklus iskustvenog učenja je način učenja kroz iskustvo (slika 5). Istraživanje je pokazalo da najbolje mladi i odrasli uče kroz praktično učenje. Ciklus funkcioniše na sledeći način: Svaka tema u LIFE Nastavnom planu i programu počinje tako što studenti pribavljaju neke nove teorijske informacije. Zatim studenti obrađuju takve informacije putem izvođenja vežbi – drugim rečima, praktično iskustvo. Nakon toga, studenti razmišljaju o tome šta su naučili i razgovaraju o tome kako oni mogu primeniti i konsoliduju svoje novo stečeno znanje. Zatim idu u stvarnom svetu i primenjuju ono što su naučili. Nakon toga, ciklus može ponovo da počne: imajući stečeno iskustvo i ocene buduće potrebe, studenti su spremni da steknu nova praktična znanja kako bi mogli aplicirati do njihovog budućeg poslovanja.



**Figure 5.** Experiential learning cycle (HP LIFE T – Tools curriculum)

**Slika 5.** Ciklus iskustvenog učenja (HP LIFE T – Kurikulum Alata)

### B-T-B FRAMEWORK:

The second pedagogical concept to keep in mind is something called the Business-Technology-Business framework or BTB for short (Figure 6). BTB means that every LIFE Curriculum topic begins with a common business challenge faced by a typical entrepreneur, anywhere in the world. By working on a business-related case study, students identify and discuss a particular business challenge. Then, the trainer introduces a technological solution to that challenge. The class is shown some of the

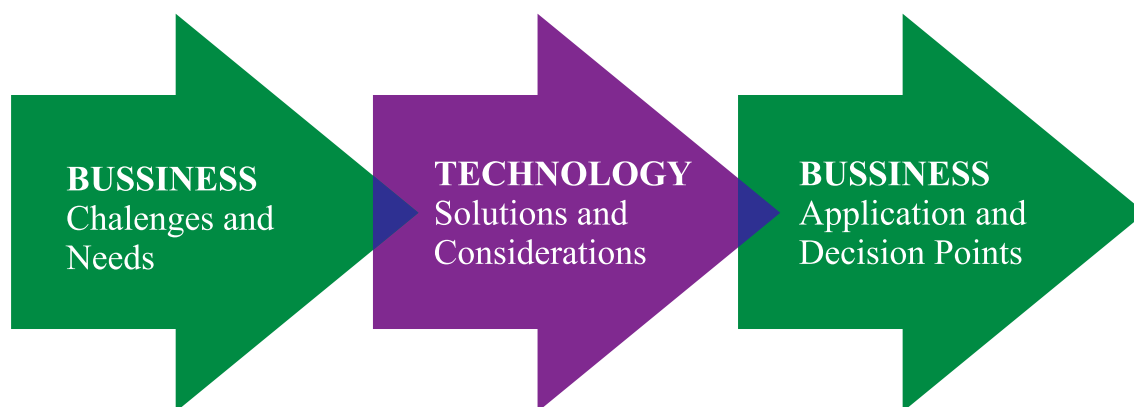
### B-T-B OKVIR:

Drugi pedagoški koncept koji treba imati na umu je nešto što se zove Biznis-Tehnologija-Biznis okvir ili BTB skraćeno (Slika 6). BTB znači da svaka tema iz LIFE nastavnog plana i programa počinje sa zajedničkim poslovnim izazovom sa kojim se suočava tipičan preduzetnik, bilo gde u svetu. Radeći na biznis-povezanost studiji slučaja, studenti identifikuju i diskutuju poseban poslovni izazov. Zatim instruktor uvodi tehnološko rešenje za taj izazov.



benefits of the technological solution and taught how to use it through a hands-on exercise. Finally, the trainer guides the class back into the domain of business and encourages the students to discuss how to use the technological tool in the real business world. The Business-Technology-Business framework ensures that students are always aware of the business relevance of the technological skills they are acquiring in class.

Razredu su prikazane neke od prednosti tehnološkog rešenja i naučen je kako da ih koriste kroz praktične. Konačno instruktor vodi razred nazad u domenu poslovanja i ohrabruje studente da razgovaraju o tome kako da koriste tehnološki alat u realnom poslovnom svetu. Biznis-tehnologija-Biznis okvir obezbeđuje da su studenti uvek svesni poslovnog značaja tehnoloških znanja stečenih u razredu.



**Figure 6.** B-T-B FRAMEWORK (HP LIFE T – Tools curriculum)

**Slika 6.** B-T-B OKVIR (HP LIFE T – Kurikulum Alata)

Knowledge obtained from this program was immediately included in the curriculum at the EMD of TFB. Accordingly, GET – IT and afterwards HP LIFE program is taught in the frame of entrepreneurship and Management Information Systems courses at our department. Each year we have at least 50 new trainees on this program.

However, we realized that it is also important to include high school students in this education. Accordingly, at EMD we are constantly seeking for funds to enable inclusion of new number of these target group members each year. One such attempt was applying with the HP LIFE SERBIA project to the national center for promotion of science in Serbia. During 2012, the Technical faculty in Bor proposed the HP LIFE Serbia to the Center for Promotion of Science in Belgrade (<http://www.cpn.rs>). The Center decided to support this project with a grant. With this money, the Technical Faculty in Bor organized training for students in Bor's high schools (the high school for economy and trade and the high school for technical education). During workshops in two high schools in Bor, 100 students attended the intensive trainings. This form

Stečeno znanje iz ovog programa je bilo odmah uključeno u nastavni plan i program EMD-a na TFB-a. Shodno tome GET-IT a potom i HP LIFE program se učio u okviru kurseva Preduzetništva i Menadžmenta Informacionih Sistema na našem odseku . Svake godine imamo na listi 50 novih polaznika ovog programa.Međutim, shvatili smo da je takođe važno da se uključe i srednjoškolce u ovim edukacijama. Shodno tome, u EMD mi stalno traže sredstva kako bi se omogućilo uključivanje novog broja ciljnih članova ovih grupa svake godine. Jedan od takvih pokušaja je apliciranje sa HP LIFE SERBIA projektom u nacionalnom centru za promociju nauke u Srbiji. Tokom 2012. godine, Tehnički fakultet u Boru je predložio HP LIFE Serbia Centru za promociju nauke u Beogradu (<http://www.cpn.rs>). Centar je odlučio da podrži ovaj projekat sa grantom. Sa ovim novcem, Tehnički fakultet u Boru organizovao je obuku za učenike srednjih škola u Boro (srednju ekonomsko trgovinska škola i srednju teknička škola). Tokom radionica u dve srednje škole u Boru, 100 studenata je prisustvovalo intenzivnoj obuci. Ovaj



of education was largely accepted by the high school students. They demonstrated enormous interest and enthusiasm for this kind of training (Figure 7). Unfortunately, the number of attendants was limited due to the scarce budget of the project.

oblik obrazovanja je u velikoj meri prihvaćen od strane srednjoškolaca. Oni su pokazali ogroman interes i entuzijazam za ovu vrstu obuke (slika 7). Nažalost, broj polaznika je ograničen oskudnim projektnim budžetom.



**Figure 7.** One of the HP LIFE training groups of high school students  
**Slika 7.** Jedana od HP LIFE trening grupa srednjoškolskih učenika

### III. Future Plans for Increasing the Entrepreneurial Potential in the Vicinity of TF BOR

Considering the future plans for additional development of entrepreneurial way of thinking, among young population in the region of the city of Bor, EMD of TFB is strongly dedicated to including additional number of high school students and elementary school students in the HP LIFE educational program. For this goal it is in constant search for additional financing, which can cover the costs of the program. Accordingly, new opportunities are recognized in the frame of ERASMUS + KA2: Cooperation for innovation and exchange of good practices – Capacity Building in the field of Higher Education programmes. With adequate consortium this idea can readily be submitted for financing through this Erasmus initiative.

### III. Budući planovi za povećanje preduzetničkog potencijala u blizini TF Bora

S obzirom na buduće planove za dodatni razvoj preduzetničkog načina razmišljanja među mladom populacijom u regionu grada Bora, EMD TFB-a snažno posvećena uključenju dodatnog broja srednjoškolaca i učenika osnovnih škola u HP LIFE obrazovnom programu. Za ovog cilja je u stalnoj potrazi za dodatnim finansiranjem koja mogu da pokrije troškove programa. U skladu s tim nove mogućnosti se prepoznate u okviru ERASMUS+ KA2: Saradnja za inovacije i razmenu dobre prakse - Izgradnja kapaciteta u oblasti programa Visokog Obrazovanja. Uz adekvatnu konzorcijum ova ideja može lako da se podnese za finansiranje u ovoj ERASMUS inicijativi.

Also, representatives of EMD are in constant process of improving the relations of the teaching staff with local companies and SMEs. In connection to this goal, there are attempts to develop entrepreneurial potential of SMEs in the region, by giving the entrepreneurs adequate trainings and presenting the possibilities for clustering with similar enterprises abroad. As an example of this activity, during 2014 EMD carried out VISEGRAD fund project: 'Possibilities for development of business cluster network between SMEs from Visegrad countries and Serbia' (<http://mksm.sjm06.com/visegrad-fund-project/>). In the frame of this project the basis for building the cluster network of entrepreneurs from V4 countries (Hungary, Poland, Czech Republic and Slovakia) and Serbia, was developed. Participants in the project, besides entrepreneurs, were also professors engaged in entrepreneurial courses and trainings from the V4 universities and TFB. This was a first step and base for further development of the future actions in this direction, which are planned to be realized as new projects in upcoming years.

#### **IV. Conclusion**

This manuscript is written in the form of a report, presenting some of the activities of the University of Belgrade (UB) in creating the bases for enabling larger entrepreneurial activities of the academic institutions in Serbia, which are the part of UB.

As presented in this paper, the final concept of Entrepreneurial University in Serbia has not been established yet, however, there are concrete actions which are leading to the development of basic conditions for introducing this concept in our academic environment in the future.

Also, the second part of the paper is presenting the activities of the Technical faculty in Bor (TF Bor), as part of UB located in Eastern Serbia, in developing the entrepreneurial spirit among the young population of this region. Besides presenting activities facilitated in the past and present, some ideas for further action in this field are also elaborated.

Takođe predstavnici EMD su u stalnom procesu unapređenja odnosa nastavnog osoblja sa lokalnim kompanijama i MSP-a. U smeru ka tom cilju postoje pokušaji da se razvije preduzetnički potencijala MSP-a u regionu, davajući preduzetnicima adekvatnu obuku i predstavljajući mogućnosti za grupisanje sa sličnim preduzećima u inostranstvu. Kao primer ove aktivnosti tokom 2014 EMD sprovodi projekat VIŠEGRAD fonda: "Mogućnosti za razvoj poslovnih klaster mreže između MSP-a iz zemalja Višegrad-a i Srbije" (<http://mksm.sjm06.com/visegrad-fund-project/>). U okviru ovog projekta razvijena je osnova za izgradnju klaster mreže preduzetnika iz zemalja V4 (Mađarska, Poljska, Češka i Slovačka) i Srbije. Učesnici u projektu osim preduzetnika su i profesori koji se drže kurseve preduzetništva i obuke iz V4 univerziteta i TFB-a. Ovo je bio prvi korak i osnova za dalji razvoj budućih akcija u tom pravcu kojie se planiraju realizovati kao novi projekti u narednim godinama.

#### **IV. Zaključak**

Ovaj rukopis je pisan u formi izveštaja predstavljajući neke od aktivnosti Univerziteta u Beogradu (UB) u stvaranju osnove za omogućavanje veće preduzetničke aktivnosti akademskih institucija u Srbiji koje su deo UB.

Kao što je prikazano u ovom rukopisu, konačan koncept preduzetničkog univerziteta u Srbiji nije uspostavljena, međutim, postoje konkretne akcije koje dovode do razvoja osnovnih uslova za uvođenje ovog koncepta u našoj akademskoj sredini u budućnosti.

Takođe, drugi deo rukopisa predstavlja aktivnosti Tehničkog fakulteta u Boru (TF Bor), kao deo UB smešten u Istočnoj Srbiji, u razvoju preduzetničkog duha među mladom populacijom u ovom regionu. Pored predstavljanja aktivnosti olakšane u prošlosti i sadašnjosti neke ideje za dalju akciju u ovoj oblasti su takođe razrađene.

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