ANALIZA ATRAKTIVNOSTI STUDIJA NAUKE I TEHNOLOGIJE

ANALYSIS OF THE ATTRACTIVENESS OF SCIENCE AND TECHNOLOGY STUDIES

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Ključne riječi:
obrazovanje, nauka i tehnologija, opadanje interesa, Bosna i Hercegovina

Keywords:
education, science and technology, declining interest, Bosnia and Herzegovina.

Paper received:
22.08.2017.

Paper accepted:
16.11.2017.

Originalan naučni rad

REZIME

U mnogim zemljama postoji zabrinutost da upis u tehničke i naučne profesije opada i da je potrebno više studenata usmjeriti i zainteresirati za karijeru u nauci i tehnologiji. Uzrok za studente da ne biraju studije u nauci i tehnologiji obično se ne tiču sposobnosti samih studenata, već su više vezane za studentsku percepciju i stav o atraktivnosti predmeta vezanih za nauku i tehnologiju. Interes za studije nauke i tehnologije postaje važno pitanje s obzirom da sve više radnih mjesta u oblasti nauke i tehnologije ostaje neupražnjeno, a i tehnološki trendovi stvaraju iz godine u godinu potrebu za novim kadrovima iz naučno-tehnoloških disciplina. Brojne studije pokazuju da interesovanje za nauku i tehnologiju opada s školskim godinama. Stoga, podizanje pozitivnih stavova, motivacije i interesa za naučne i tehnološke predmete postaje ključno pitanje. Ovaj rad analizira broj upisanih studenata u Federaciji Bosne i Hercegovine za period od 2009. do 2017. godine. Iz analize zaključujemo da su među najpopularnijim studijima studiji društvenih i humanističkih nauka sa jakim porastom popularnosti zdravstvenih studija, dok studiji vezani za prirodne nauke i tehnologiju još nisu stekli željenu popularnost. Svrha ovog istraživanja je podizanje svijesti o zanemarivanju podsticanja studija iz oblasti tehničkih nauka. Stoga, ovo istraživanje predstavlja uvod za buduća istraživanja o atraktivnosti studija tehničkih nauka.

Original scientific paper

SUMMARY

In many countries, there is concern that enrolment in science and technology professions is decreasing and that more students need to be directed and interested in a career in science and technology. The reason why students do not choose science and technology studies is usually not about their abilities, but it is more related to student perceptions and attitudes about the attractiveness of subjects related to science and technology. Interest in science and technology studies is becoming an important issue given that more and more jobs in the field of science and technology remain empty, and technological trends create the need for new staff from science and technology disciplines every year. Numerous studies have shown that interest in science and technology has been declining with school years. Therefore, raising positive attitudes, motivation and interest in scientific and technological subjects becomes a key problem. This paper analyses the number of enrolled students in the Federation of Bosnia and Herzegovina for the period from 2009 to 2017. From the analysis, we conclude that among the most popular studies are the those of social and humanistic sciences with a strong increase in the popularity of health studies, while studies related to natural sciences and technology have not yet gained the desired popularity. The aim of this research is to raise awareness of the neglect of encouraging studies in the field of technical sciences. Therefore, this research represents an introduction for future research on the attractiveness of technical studies.

1. UVOD

Od djetinjstva do adolescencije oni sa višim stepenom akademske motivacije su ujedno i više kompetentni u školi, dokazujući znatno veće akademsko postignuće, pozitivnije percepcije njihove akademske kompetencije, kao i niže akademske anksioznosti i manje ekstrinzične motivacije (Gottfried et al., 2009:729). Istraživanje ukupnih efekata pokazalo je važne uticaje akademskog vremena, stava i motivacije na postignuće. Od primarnog značaja je dokaz snažnih efekata motivacije, pozitivnog odnosa i angažovanja u akademskom radu za uspeh u matematici i nauci (Singh et al., 2002:330).

Prema Panu, dobro je utvrđeno i utemeljeno da je motivacija ključna za predviđanje akademskog postignuća studenta, te je istraživanje pokazalo da *u poređenju sa sposobnošću (npr. ACT/SAT rezultati i IQ), akademska motivacija je bolji prediktor uspjeha učenja studenata* (Pan i Gauvain 2012:92). Drugi autori su pokazali da je motivacija ključna za postizanje i samoostvarivanje (Cavas, 2011:31). Također, došlo je do shvatanja da stav igra važnu ulogu u namjeri da se nastave studije u domenu prirodnih nauka. U istraživanima provedenim u SADu i Australiji, pokazano je da su stavovi prema naučnim časovima najbolji prediktori namjera učenika da se upišu studije nauke (Reid i Skryabina 2002:69). Stoga i smatramo da bi evolucija individualnih interesa, stavova i motivacija trebala biti dodatno ispitana, jer ukazuje na povezanost istih sa odabirom studije budućih studenata.

Barmby i saradnici (2008.) su ustanovili u svom istraživanju o padu stavova, koje je obuhvatilo publikacije od 1975. do 2006. godine, pronašli petnaest studija koje su zabilježile pad na sekundarnom a samo jednu koja nije zabilježila nikakva vid promjene, kao i četiri studije koje su ustanovile pad na osnovnom nivou obrazovanja u odnosu na četiri koje nisu ustanovila nikakve promjene. Gottfried i saradnici (2009) su analizirajući sedam novijih studija ustanovili da su matematika i nauka posebno zabrinjavajući.

Pad značajnih konstrukata interesa, kao što su motivacija i stav, sa godinama često je razmatran i obrađen u literaturi o edukaciji o nauci. Osborne i saradnici (2003) su iznijeli je vrlo interesantnu sintezu u kojoj su identifikovali devet značajnih studija objavljenih između 1976.

1. INTRODUCTION

From childhood to adolescence, those with a higher degree of academic motivation are also more competent at school, proving significantly higher academic achievement, more positive perceptions of their academic competence, and lower academic anxiety and less extrinsic motivation (Gottfried et al., 2009: 729). The study of overall effects has shown the important impacts of academic time, attitude and motivation on achievement. Of primary importance is the evidence of the powerful effects of motivation, positive attitudes and engagement in academic work for success in mathematics and science (Singh et al., 2002: 330).

According to the Pan, it is well established that the motivation is the key to predicting the academic achievement of the student, and the research showed that *compared to the ability (e.g. ACT/SAT results and IQ) academic motivation is a better predictor of student learning success* (Pan and Gauvain 2012: 92). Other authors have shown that motivation is crucial for achievement and self-development (Cavas, 2011: 31). It came to the understanding that attitude plays an important role in the intent to continue studies in the field of natural sciences. In research conducted in the United States and Australia, it has been shown that attitudes toward scientific lessons are the best predictors of students' intentions to enrol in science studies (Reid and Skryabina 2002: 69). Therefore, we believe that the evolution of individual interests, attitudes and motivations should be further tested as it points to the connection between them with the choice of a study of future students.

Barmby et al. (2008) found in their research on the decline in attitudes, which included publications from 1975 to 2006, fifteen studies that recorded a decline on the secondary one and only one that did not record any kind of change, as well as four studies that have found a drop in the basic level of education compared to four who have not found any changes. Gottfried et al (2009) analysing seven new studies found that mathematics and science are particularly troubling.

The decline in significant constructs of interest, such as motivation and attitude, with years is often considered and addressed in the science education literature. Osborne et al. (2003) presented a very interesting synthesis identifying nine significant studies published between 1976

i 2001. godine, koje su ukazivale na smanjenje stavova studenata od 11 godina i više. Svih devet studija pokazuju kako se interesovanje djece i stav prema nauci opadaju prelaskom u srednju školu. Također, Venturini (2004) je u svojoj mreži istraživanja došao do istog zaključka, navodeći i analizirajući zasebnih sedam studija.

and 2001, which indicated a decline in students' attitudes of eleven years old or more. All nine studies show that the interest of children and attitudes toward science is decreasing by moving to secondary school. Also, Venturini (2004) came to the same conclusion in his research network, citing and analysing separate seven studies.

Tabela 1. *Istraživački članci koji su zabilježili pad interesovanja, motivacije, stavova ili entuzijazma za nauku i tehnologiju*[1]

Table 1. *Research articles that recorded a decline in interest, motivation, attitudes or enthusiasm for science and technology*[2]

			Godine		4	5	6	7	8	9	10	11	12	13	14	15	16	+
			Školska godina			O	1	2	3	4	5	6	7	8	9	10	11	+
Referenca	Zemlja	Varijable	Uzorak (N)	Protokl														
Turner i Ireson (2014)	UK	Stav i entuzijazam	15	Longitudinalni			S				↘	↕						
Alexander et al. (2012)	SAD	Interes	192	Longitudinalni	S	↘	↘	↘										
Cavas (2011)	Turska	Motivacija	376	Transverzalni								S	↘	↘				
Hong i Lin (2011)	Tajvan	Interes i stav	2876	Transverzalni							S			↘			↕	
Kirikkaya (2011)	Turska	Entuzijazam	540	Transverzalni						S	↘	↕	↘	↘				
Vedder-Weiss i Fortus (2011)	Izrael	Stav	1181	Transverzalni							S	↘	↘	↕				
Guvercin et al. (2010)	Turska	Motivacija	2231	Transverzalni								S		↘				
Francis i Greer (2001)	UK	Stav	1534	Transverzalni											S	↘	↘	
Bennett i Hogarth (2009)	UK	Stav	280	Transverzalni								S			↘		↕	
Cheung (2007)	Hong Kong	Stav	954	Transverzalni												S	↘	↘
Devetak et al. (2009)	Slovenija	Motivacija	191	Transverzalni					S	↘								
Gottfried et al. (2009)	SAD	Motivacija	130	Longitudinalni						S	↘			↘			↘	↘
Barmby et al. (2008)	UK	Stav	932	Transverzalni									S	↘	↘			
Hassan (2008)	Australija	Stav i motivacija	1745	Transverzalni												S	↗	↕
Logan i Skamp (2008)	Australija	Stav i interes	20	Longitudinalni								S		↕				
Owen et al. (2008)	UK	Stav i interes	1288	Transverzalni									S	↘	↘	↘	↘	
Sorge (2007)	SAD	Stav	1008	Transverzalni						S	↘	↘	↘	↕	↘			
Murphy et al. (2006)	UK i Oman	Stav	1923	Transverzalni						S			↘					
George (2000; 2006)	SAD	Stav	444	Longitudinalni									S	↘	↘	↕	↘	
Reid i Skryabina (2002)	Škotska	Stav	850	Transverzalni								S	S		↘	↕	↗	↘
Pell i Jarvis (2001)	UK	Stav i entuzijazam	800	Transverzalni			S	↘	↘	↘	↘	↘						

Novije istraživanje i pregled literature i studija vezanih za zainteresiranost ka studijama prirodnih nauka i tehnologije dato je od strane Potvina i Hasnija (2014) koji su analizirali literaturu od 2000. godine pa nadalje.

Recent research and review of literature and studies related to the interest in science and technology studies was given by Potvin and Hasni (2014) who analysed literature from year 2000 onwards.

[1] Izvor: Adaptirano prema istraživanju Potvina i Hasnija (2014)
[2] Source: Adapted from Potvin and Hasni (2014)

Analizirana literatura obuhvata 21 ERIC-indeksiran[3] članak na temu pada zainteresiranosti za studije prirodnih nauka i tehnologija. U tabeli 1. prikazan je pregled navedenih članak prema godinama njihove publikacije. Tabela sadrži podatke o autorima, mjestu porijekla podataka, proučavanim i korištenim varijablama, ukupnom broju uzorka, kao i o vrsti korištenog protokola. Transverzalni protokol promatra različite učenike iz različitih školskih godina, dok longitudinalni promatra iste učenike koji su praćeni tokom dužeg vremenskog perioda (Potvin i Hasnij, 2014).

Slovo S označava najnižu školsku godinu kada je ispitivanje započelo, crvena strelica ka dolje označava značajan pad u odnosu na prethodni zabilježeni nivo, dok zelena strelica ka gore označava porast. Siva strelica okrenuta ka gore i dolje pokazuje da nisu zabilježene veće ili značajnije varijacija.

Iz tabele se jasno vidi da postoji konstanta tendencija pada interesovanja, motivacije, stavova i entuzijazma za nauku i tehnologiju. Tragično, čini se da škola nije učinila ništa za svoje učenike u smislu podsticanja njihovog interesovanja za nauku. Zapravo, navedeni podaci nam ne pokazuju poboljšanje stava prema nauci kod učenika od 9 godina pa više što dovodi do spekulacija da upravo školsko educiranje učenika o nauci čini više štete nego dobra (Osborne et al., 2003). Objašnjenje navedene situacije nastoje objasniti mnogi istraživači. Barmbi (2008) tvrdi da se nauka koja se proučava u školi ne percipira kao praktična iako je dobro objašnjena ili relevantna. Krapp (2011:35) objašnjava navedeni pad pretpostavkom da razvoj naučnog interesa prvenstveno zavisi od kvaliteta i vrste instrukcija.

2. NAKLONOST PREMA NAUCI I TEHNOLOGIJI

Studenti uglavnom ne vole da studiraju prirodne nauke i tehnologiju. Različita istraživanje stavova studenata prema nauci i tehnologiji potvrđuju ovakav negativan stav prema nauci. Takav vid negativnosti naročito dolazi do izražaja kod starijih studenata, tj. odbojnost ka nauci i tehnologiji raste sa starenjem studenata.

[3] ERIC (Educational Resources Information Center) je najčešće korišten indeks vezan za literaturu o obrazovanju (https://eric.ed.gov/).

The analysed literature includes 21 ERIC-indexed[4] articles on the topic of falling interest in natural science and technology studies. Table 1 shows the review of the articles listed by the years of their publication. The table contains information about authors, place of origin of the data, studied and used variables, the total number of samples, and the type of protocol used. The transversal protocol examines different students from different school years, while longitudinal observes the same students who have been followed for a long period of time (Potvin and Hasni, 2014).

The letter S indicates the lowest school year when the test started, the red arrow down indicates a significant drop in relation to the previous recorded level, while the green arrow up indicates an increase. The grey arrow facing up and down shows that no significant variations have been recorded.

The table clearly shows that there is a constant tendency of falling interest, motivation, attitudes and enthusiasm for science and technology. Tragically, it seems that the school did not do anything for its students in terms of encouraging their interest in science. In fact, the given data does not show us the improvement of the attitude towards science in the students of 9 years old and up, which leads to speculation that school education of students about science is more damaging than good (Osborne et al., 2003). Many researchers are trying to explain the situation. Barmbi (2008) argues that science studied at school is not perceived as practical, although it is well explained or relevant. Krapp (2011:35) explains the above with assumption that the development of a scientific interest primarily depends on the quality and type of instructions.

2. AFFECTION FOR SCIENCE AND TECHNOLOGY

Students generally do not like to study natural sciences and technology. Different researches of student attitudes towards science and technology confirmed this negative attitude towards science. This type of negativity is especially evident in older students, i.e. aversion towards science and technology is growing with the aging of students.

[4] ERIC (Educational Resources Information Centre) is the most widely used index on education literature (https://eric.ed.gov/).

Stoga, većina istraživača i predlaže da se pozitivan stav i interes ka nauci i tehnologiji krene da razvija već kod učenika u ranom dobu. Istraživanje od strane Osborna i saradnika (2009) pokazuje da su stavovi studenata prema nauci i tehnologiji formirani u dobu između 10. i 14. godine, te ukazuju na to da u 14. godini su stvoreni oformljeni stavovi učenika, što u velikoj mjeri utječe na njihov budući izbor karijere. Također, žene nisu dovoljno zastupljene u profesijama nauke i tehnologije (Osborne et al., 2003 i Hill et al., 2010), ali ova nejednakost nije izazvana nemogućnošću savladavanja ovih profesija od strane djevojčica, ali jest rezultat izbora djevojčica tokom njihove školske karijere (Hill et al., 2010). Stepen postignuća djevojčica je sličnom nivou postignuća dječaka (OECD, 2006 i Elwood i Comber, 1996), ali, za razliku od dječaka, djevojčice imaju veću zastupljenost negativnih stavova prema nauci i tehnologiji (Kind et al., 2007 i Osborne et al., 2003).

Problem stvaranja pozitivnog stava ka nauci nalazimo i iz istraživanja koje dokazuje da nastavnici osnovnih škola ocjenjuju nauku među najgorim i najmanje zanimljivim predmetom za podučavanje (Wilkins, 2010). Stoga, nije ni čudna činjenica da se nastavnici razlikuju u stepenu pokazivanja entuzijazma dok predaju predmete vezane za nauku i tehnologiju (Trumper, 1998 i Palmer, 2004). Nastavnici su ti koji mogu utjecati na iskustva učenika kroz svoje sposobnosti da sasvim slučajno ili pak namjerno ugrade vrijednosti i uvjerenja u svoje učenje, da bi učenici mogli prihvatiti te vrijednosti i vjerovanja kao svoje stavove (Frenzel et al., 2009).

Takvi stavovi prema nastavi nauke i tehnologije su najčešće povezani sa relativno niskim osjećanjima kompetentnosti kao i niskim nivoima samo-efikasnosti nastavnika u nastavi nauke i tehnologije (Beilock et al., 2010). To predstavlja problem, s obzirom da upravo škole igraju glavnu ulogu u razvoju pozitivnih stavova učenika ka određenim predmetima i profesijama (Davis, 2003). Teorije društvenog kognitivnog učenja nam dokazuju da djeca uče promatrajući ponašanja svojih nastavnika, te na taj način oblikuju svoje stavove prema predmetu slušajući komentare nastavnika i promatrajući uživanje svojih učitelja dok predaju određenu temu (Frenzel et al., 2009). Pored toga, nastavnici koji nemaju sposobnosti, entuzijazam i samopouzdanje imaju visok stepen vjerovatnosti da njihovi učenici budu učenici sa lošim stavovima (Osborne i Simon, 1996).

Therefore, most researchers suggest that positive attitude towards science and technology needs to develop already at students early age. The research by Osborne et al. (2009) shows that students' attitudes toward science and technology have been formed between the ages of 10 and 14, indicating that at the age of 14, student attitudes were created, which greatly affected their future career choice. Also, women are not sufficiently represented in the professions of science and technology (Osborne et al., 2003 and Hill et al., 2010), but this inequality is not caused by the inability to overcome these professions by girls, but is the result of the selection of girls during their school career (Hill et al., 2010). The level of achievement of girls is similar to the level of achievement of boys (OECD, 2006 and Elwood and Comber, 1996), but, unlike boys, girls have a higher proportion of negative attitudes toward science and technology (Kind et al., 2007 and Osborne et al., 2007) 2003).

The problem of creating a positive attitude towards science is also found in research that proves that teachers of elementary school's rate science among the worst and least interesting subject of instruction (Wilkins, 2010). Therefore, it's no wonder that teachers differ in the degree of enthusiasm while teaching subjects related to science and technology (Trumper, 1998 and Palmer, 2004). Teachers are those who can influence students' experiences through their ability to accidentally or intentionally integrate values and beliefs into their own teaching so students can accept these values and beliefs as their attitudes (Frenzel et al., 2009).

Such attitudes towards teaching science and technology are most often associated with relatively low feelings of competence as well as low levels of self-efficacy of teachers in teaching science and technology (Beilock et al., 2010). This is a problem, since schools play a major role in the development of students' positive attitudes towards certain subjects and professions (Davis, 2003). Theories of social cognitive learning show that children learn by observing the behaviour of their teachers, thus forming their attitudes toward the subject by listening to teachers' comments and observing the enjoyment of their teachers while teaching a subject (Frenzel et al., 2009). In addition, teachers who lack capabilities, enthusiasm, and self-confidence have a high degree of probability that their students become students with poor attitudes (Osborne and Simon, 1996).

Stoga je ključno da imamo pozitivan stav učitelja, nastavnika i profesora prema nauci i tehnologiji da bi omogućili razvoj pozitivnih stavova učenika i studenata.

Analizom broja upisanih studenata u Federaciji Bosne i Hercegovine (tabela 2) za period od 2009. do 2017. godine, isključujući upis 2015. godine zbog nedostupnosti adekvatnih podataka, vidimo da je ukupni broj studenata koji su se upisali opada od 2013. godine.

U kumulativnom poređenju upisanih u navedenom periodu uočavamo da su među najpopularnijim studijima studiji društvenih i humanističkih nauka sa jakim porastom popularnosti zdravstvenih studija (slika 1).

Therefore, it is crucial that we have a positive attitude of teachers and professors to science and technology in order to enable the development of positive attitudes of students.

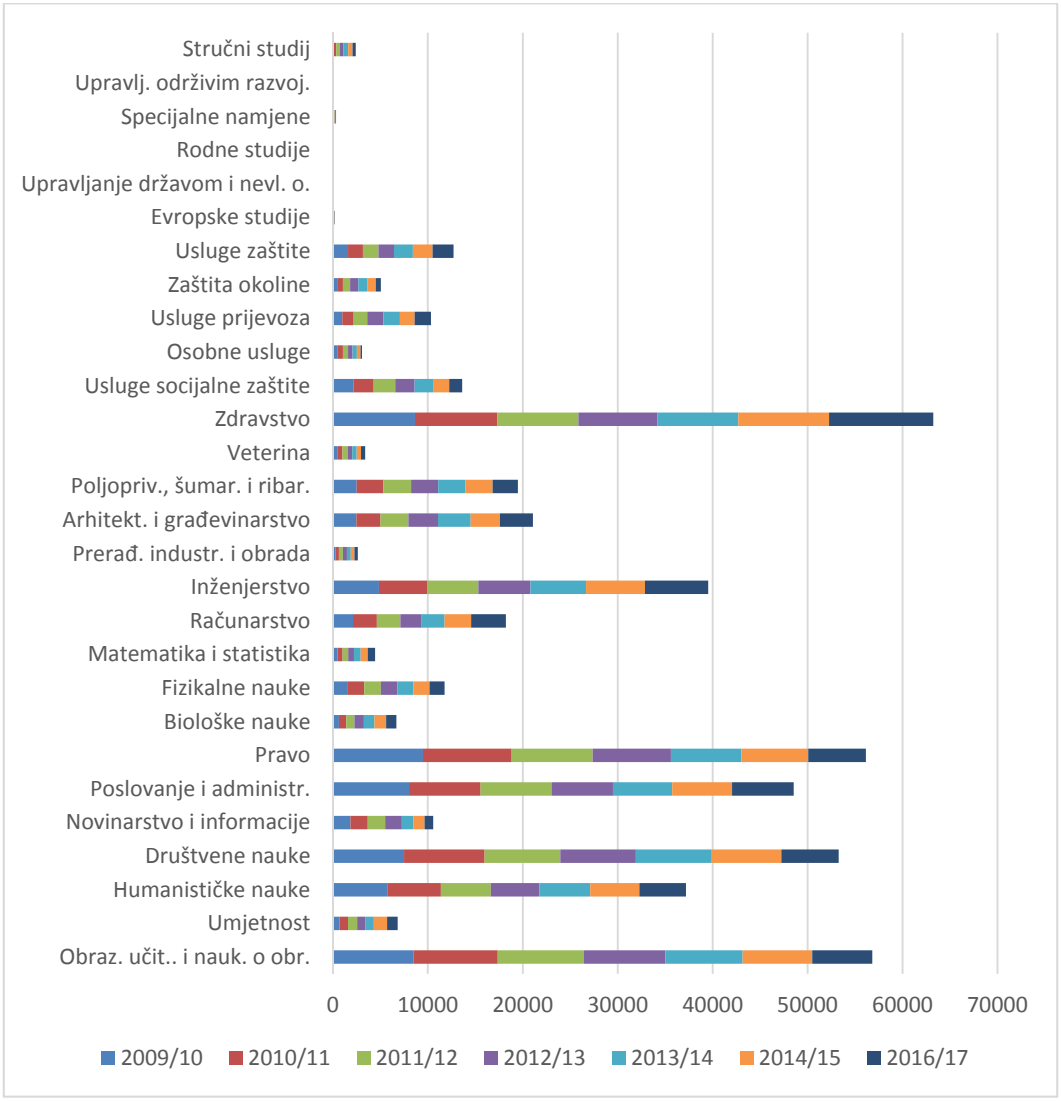
By analysing the number of enrolled students in the Federation of Bosnia and Herzegovina (table 2) for the period from 2009 to 2017, excluding the enrolment in 2015 due to the inaccessibility of adequate data, we can see that the total number of students enrolled has decreased since 2013.

In the cumulative comparison of enrolled students in the mentioned period, we notice that among the most popular studies are studies of social and humanistic sciences with a strong increase in the popularity of health studies (figure 1).

Tabela 2. *Upisani studenti prema polju obrazovanja u FBiH*
Table 2. *Students enrolled according to the field of education in FB&H*

Polje obrazovanja ***Field of Education***	**Akademska godina Academic year**						
	2009/10	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2016/17**
Obraz. učit.. i nauk. o obr. Teach. educ. and sci. educ.	8474	8880	9094	8576	8132	7328	6321
Umjetnost - Arts	711	888	959	834	920	1394	1114
Humanističke nauke Humanistic sciences	5729	5651	5252	5114	5354	5177	4910
Društvene nauke Social sciences	7501	8477	7969	7964	7989	7331	6037
Novinarstvo i informacije Journalism and information	1852	1825	1832	1745	1240	1160	909
Poslovanje i administr. Business and administration	8024	7530	7464	6483	6229	6310	6499
Pravo - Law	9482	9343	8526	8258	7406	7059	6061
Biološke nauke Biological sciences	642	765	868	996	1113	1221	1090
Fizikalne nauke Physical sciences	1583	1710	1763	1738	1674	1717	1579
Matematika i statistika Mathematics and statistics	490	527	590	609	706	748	769
Računarstvo- Computing	2111	2517	2484	2243	2415	2787	3654
Inženjerstvo- Engineering	4853	5097	5376	5490	5851	6205	6654
Prerađ. industr. i obrada Manufactur. and processing	283	357	411	428	406	388	359
Arhitekt. i građevinarstvo Architect. and civil engineer.	2481	2542	2927	3124	3436	3091	3476
Poljopriv., šumar. i ribar. Agric., foresty and fishing	2501	2828	2912	2840	2893	2848	2661
Veterina- Veterinary	512	494	537	493	474	449	449
Zdravstvo- Health	8642	8692	8523	8315	8535	9544	10987
Usluge socijalne zaštite Services of social welfare	2157	2133	2275	2040	2005	1646	1364
Osobne usluge	512	553	525	470	469	379	154

Other services							
Usluge prijevoza Transport services	995	1184	1440	1698	1739	1555	1712
Zaštita okoline Environmental protection	448	612	752	865	969	867	537
Usluge zaštite Security services	1598	1574	1625	1644	1987	2068	2217
Evropske studija European Studies		59	30	30	29	40	31
Upravljanje državom i nevl. o. Management of the State and NGOs			17	6	17	15	
Rodne studija- Gender studies			18			8	
Specijalne namjene- Special purpose				88	89	88	64
Upravlj. održivim razvoj. Managing Sust. Development		12	22				19
Stručni studij Professional Studies		344	374	369	524	450	342
UKUPNO- TOTAL	**71581**	**74594**	**74565**	**72460**	**72601**	**71873**	**69969**



Slika 1. *Kumulativni prikaz upisanih studenata po poljima obrazovanja u FBiH*

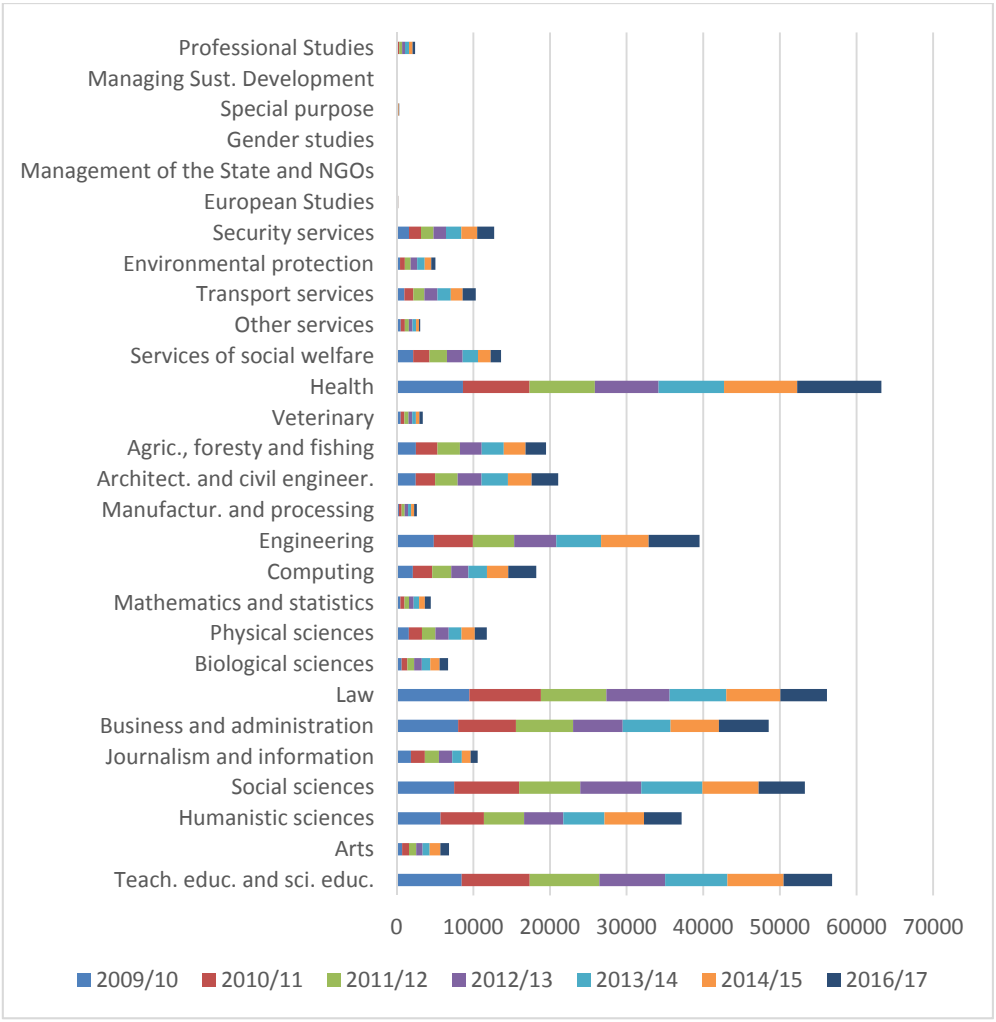


Figure 1. *Cumulative presentation of enrolled students by fields of education in FB&H*

Nažalost studiji prirodnih nauka i tehnologije nisu među najpopularnijim, što nije ni čudno, s obzirom da i literatura naglašava konstantan problem smanjenosti interesovanja za studije iz oblasti prirodnih nauka i tehnologije.

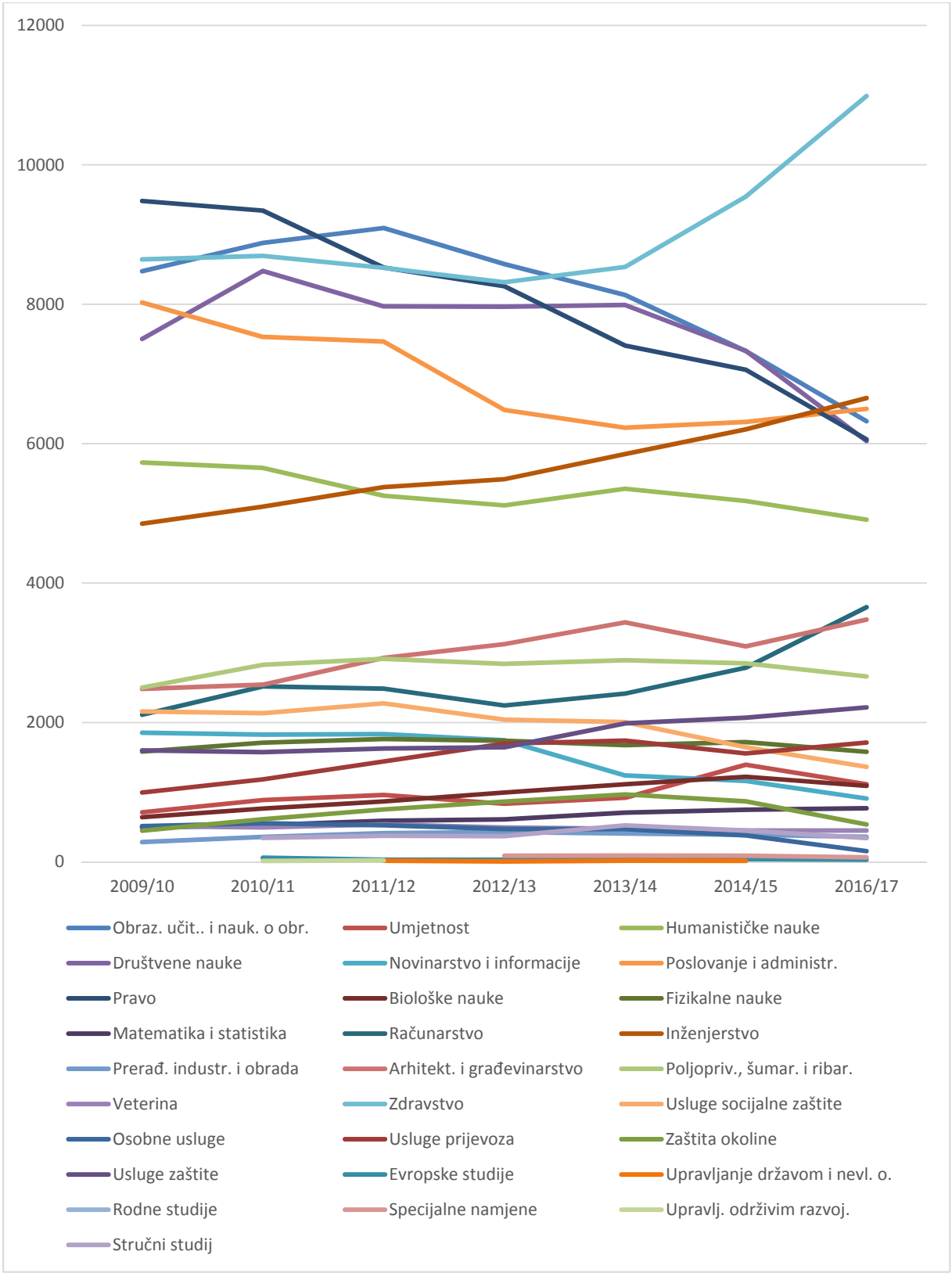
Analiza trendova popularnosti upisa po poljima studija pokazuje najveći porast zainteresiranosti za studije iz oblasti zdravstva u zadnje tri godine (slika 2). Ovaj podatak je u skladu sa porastom potražnje kadra iz oblasti zdravstvene njege u zemljama EU.

Interesantna i značajna činjenica je da studij inženjerstva je u konstantnom porastu u analiziranom periodu sa stabilnim trendom rasta, dok su studiji iz društvenih i humanističkih nauka u padu u protekle tri godine (slika 3). Nažalost, ostali studiji vezani za prirodne nauke i tehnologiju još nisu stekli željenu popularnost. Studiji iz oblasti informacionih tehnologija je u protekloj godini zabilježio značajniji rast, ali njegov nivo popularnosti nije ni blizu očekivanog s obzirom na značajan porast novonastalih poslova iz oblasti informacionih tehnologija.

Unfortunately, the studies of natural sciences and technology are not among the most popular, which is not surprising, since literature also emphasizes the constant problem of reduced interest in natural science and technology studies.

An analysis of trends in enrolment by field of education shows the highest increase in interest in health studies in the last three years (figure 2). This data is in line with the increase in the demand for healthcare personnel in EU countries.

An interesting and significant fact is that the study of engineering has been steadily increasing in the analysed period with a stable growth trend, while studies in social and humanistic sciences have been declining over the past three years (figure 3). Unfortunately, other studies related to natural science and technology have not yet gained the desired popularity. Information technology studies have recorded significant growth in the past year, but its level of popularity is not nearly as expected, given the significant increase in newly emerging IT jobs and positions.



Slika 2. *Prikaz trenda upisa studenata po poljima obrazovanja u FBiH*

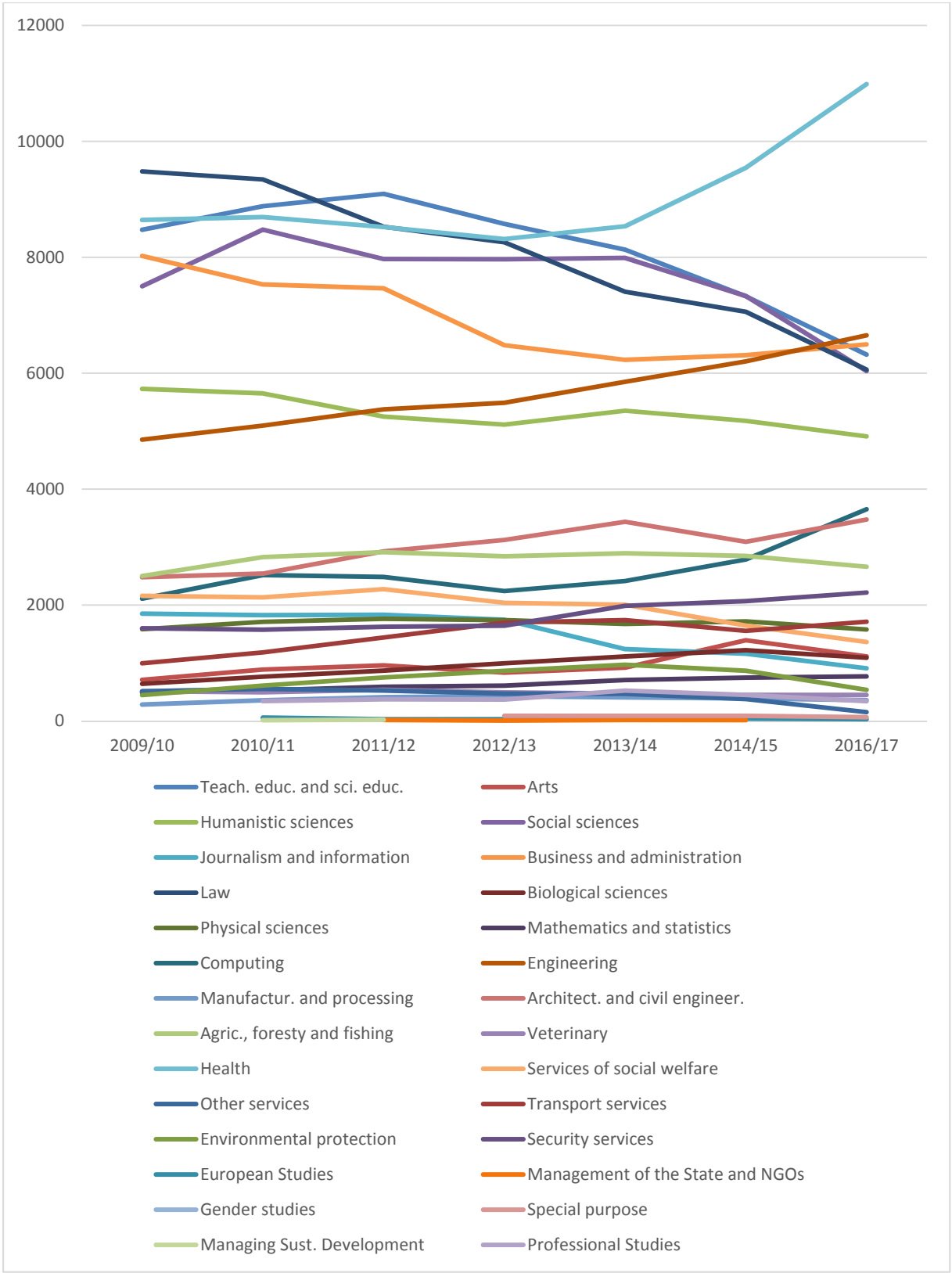
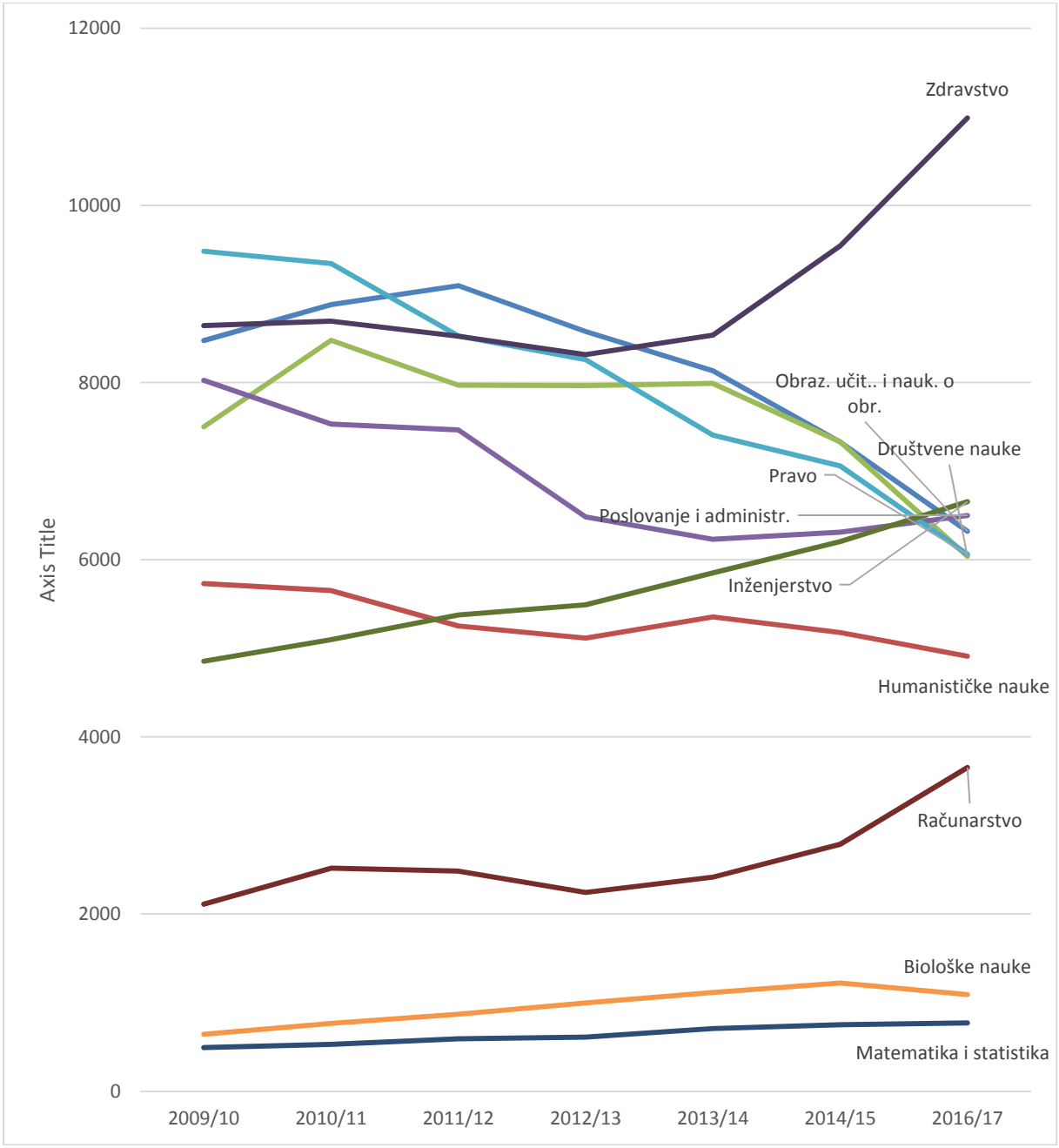


Figure 2. *Presentation of students' enrolment trends by fields of education in FB&H*



Slika 3. *Poređenje trenda upisa studenata po analiziranim poljima obrazovanja u FBiH*

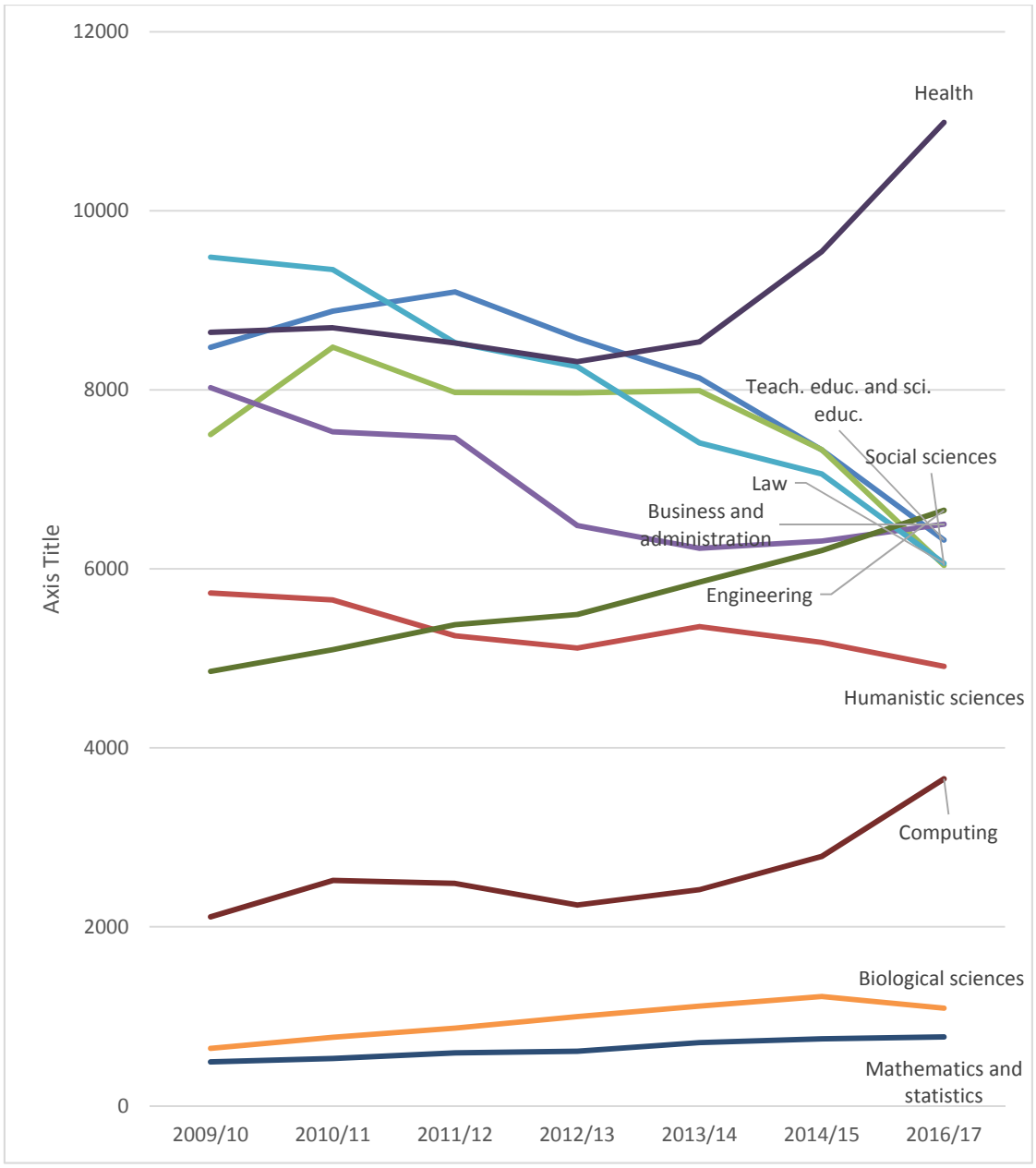


Figure 3. *Comparison of student enrolment trends in analysed fields of education in FB&H*

3. ZAKLJUČNA RAZMATRANJA

Pored investiranja u atraktivnost studija nauke i tehnologije, obrazovne institucije mogu odlučiti da angažuju predmetne specijaliste za predavanje predmete vezanih za nauku i tehnologiju s obzirom da entuzijazam nastavnika i profesora igra važnu ulogu u formiranju pozitivnih stavova studenata. Na taj način učenici i studenti mogu imati koristi od predavača ispunjenog entuzijazmom i koji se osjeća samouvjereno i kompetentno u predmetima koje predaje.

U ovom radu pokušali smo da analiziramo problematiku koja se tiče opadanja interesa za nauku i tehnologiju u obrazovnim institucijama.

3. CONCLUDING REMARKS

In addition to investing in the attractiveness of science and technology studies, educational institutions can decide to hire subject specialists to teach science and technology subjects as the enthusiasm of teachers and professors plays an important role in shaping students' positive attitudes. In this way, students can benefit from an enthusiastic lecturer who feels confident and competent in the subjects he teaches.

In this paper, we have tried to analyse the problem of declining interest in science and technology in educational institutions.

Ustanovili smo da je navedeni pad interesovanja rasprostranjen čak i u Bosni i Hercegovini. To nije ni čudno, s obzirom da u poređenju sa drugim akademskim predmetima, predmeti nauke i tehnologije se smatraju sve težim i važnijim.

Interesantno je i saznanje da je studij inženjerstva u konstantnom porastu sa stabilnim trendom rasta u Federaciji Bosne i Hercegovine, dok su studiji iz društvenih i humanističkih nauka u padu u proteklim godinama. Poražavajuća je činjenica da ostali studiji vezani za prirodne nauke i tehnologiju još uvijek nisu stekli željeni nivo popularnosti, te je stoga i nivo interesovanja za iste nedovoljno stimuliran.

Najveći porast zainteresiranosti nalazimo u studijima vezanim za oblast za zdravstva. Ovaj porast nije iznenađujući, nego je u čak i logičan, s obzirom na veliki porast potražnje kadra iz oblasti zdravstvene njege u zemljama EU. Studiji iz oblasti informacionih tehnologija je u protekloj godini zabilježio značajniji rast, ali njegov nivo popularnosti nije ni blizu očekivanog s obzirom na značajan porast novonastalih poslova iz oblasti informacionih tehnologija.

Navedena saznanja daju nam uvid u popularnost različitih studija u FBiH. Vlada zajedno sa akademskom zajednicom bi trebala da se ozbiljnije pozabavi navedenim problemom i da uđe u savremene trendove i tokove kroz stimulaciju studija sa većim prosperitetom zapošljavanja te da na taj način reducira stepen nezaposlenosti kao i stepen hiperprodukcije kadrova.

Cilj ovog istraživanja je podizanje svijesti o zanemarivanju podsticanja studija iz oblasti tehničkih nauka kao i stimulaciji mladih da upišu studije tehničke struke. Stoga, ovo istraživanje predstavlja uvod za buduća istraživanja o atraktivnosti studija tehničkih nauka, kao i osnov za rješavanje problema nedovoljnog interesovanja za tehničke predmete i oblasti.

We found that this decline in interest is widespread even in Bosnia and Herzegovina. This not even strange considering that, compared to other academic subjects, subjects of science and technology are considered increasingly difficult and more important.

It is also interesting that the study of engineering is constantly increasing with a stable growth trend in the Federation of Bosnia and Herzegovina, while studies in social and humanistic sciences have been declining in recent years. It is a devastating fact that other natural science and technology studies have not yet reached the desired level of popularity, and therefore the level of interest in them is not sufficiently stimulated.

The greatest increase in interest is found in health-related studies. This increase is not surprising, but it is even logical, given the high demand for health care personnel in EU countries. Information technology studies have recorded significant growth in the past year, but its level of popularity is not nearly as expected, given the significant increase in newly emerging IT positions and jobs.

These findings give us an insight into the popularity of various studies in the FB&H. The government together with the academic community should seriously address this problem and enter contemporary trends through the stimulation of studies with greater prosperity of employment, thus reducing the level of unemployment as well as the level of personnel hyperproduction.

The aim of this research is to raise awareness of the neglect of encouraging studies in the field of technical sciences as well as stimulating young people to enrol in technical studies. Therefore, this research represents an introduction for future research on the attractiveness of technical science studies, as well as the basis for solving the problem of insufficient interest in technical subjects and areas.

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