

Analysis of the Relationship between Learning Outcomes of Study Programs and Their Courses

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Abstract

This paper analyzes the learning outcomes of study programs and courses at the Faculty of Humanities and Social Sciences, University of Zagreb, and associates them with levels of Bloom's taxonomy in order to determine their relationships. The analysis showed statistically significant differences in the levels of learning outcomes between studies and their courses. The outcomes of study programs place more emphasis on higher levels of cognitive, affective and psychomotor domains. It was determined that there is a slight difference between the courses at the undergraduate and graduate levels of study, which is in accordance with expectations as the learning outcomes at the undergraduate level include lower levels of cognitive and affective domains. The analysis of compulsory and elective courses showed that elective courses place more emphasis on the cognitive domain, whereas compulsory courses place more emphasis on the affective domain.

Key words: *Bloom's taxonomy; comparison of learning outcomes; levels of learning outcomes.*

Introduction

One of the reforms of Croatian higher education includes a change in the planning of courses and study programs, where the focus shifts from the content that is taught to the student who is taught, and the development of his skills, abilities and attitudes (Piršl & Ambrosi-Randić, 2010; Lončarić & Pejić Papak, 2009). Course objectives are still important but they are written from the perspective of teachers, while the skills and

abilities are defined from the student's point of view. Skills and abilities are not defined only for courses, but can also be defined for a module, or a study program. However, they must be defined in a way that makes them easily measured or tested, and are stated as learning outcomes (Lasić-Lazić et al., 2012).

Learning outcomes state what is expected of a student to know, understand and/or be able to demonstrate after a completion of the learning process (European Commission, 2009). Defining learning outcomes is not a trivial process because they must be measurable, clear and achievable, and must comply with the course content. Because of that, teachers mostly rely on the existing models and manuals to assist them in planning, preparation and evaluation (Lončar-Vicković & Dolaček-Alduk, 2016).

One of the most used theoretical models of classification is Bloom's Taxonomy of knowledge (Orey, 2010). It was designed in the middle of the previous century and is based on the studies of intellectual behaviors which help students acquire academic knowledge (Nimac, 2011). According to Bloom's Taxonomy, the results of teaching process are classified into three domains: cognitive, affective and psychomotor domain.

The cognitive domain refers to the knowledge and the development of intellectual skills, and includes the recall or recognition of facts, patterns and concepts that facilitate the development of intellectual abilities (Orey, 2010). The cognitive domain consists of six levels that can be seen as levels of complexity: knowledge, comprehension, application, analysis, synthesis and evaluation. Levels follow one another, and a person cannot go to the next level until he/she has mastered the previous one. For example, a student cannot understand a concept, if it has not previously been memorized (Churches, 2008).

The affective domain refers to the student's emotional reactions and attitudes, and among other things, includes feelings, enthusiasm and motivation (Clark, 2015). This domain is divided into five levels: receiving, responding, valuing, organizing and characterizing. The psychomotor domain refers to the physical activity, coordination and usage of motor skills (Clark, 2015). This domain consists of seven levels: perception, set, guided response, mechanism, complex overt response, adaption and organization.

Manuals and technical literature provide active verbs, and verbs that express the students' activity. Active verbs are very useful when defining the learning outcomes because they almost unambiguously set a learning outcome in the desired level of taxonomy.

This paper analyzes the active verbs and learning outcomes of courses and studies at the Faculty of Humanities and Social Sciences in Zagreb. The final goal is to identify similarities and differences between the level of learning outcomes of study programs and their courses, between courses at the undergraduate and graduate levels, and between compulsory and elective courses.

It is expected that the levels of the learning outcomes of study programs are in accordance with the levels of their courses and so there should be no noticeable difference between them. If study programs are described with a certain level of active verbs, then there should be an equal level of active verbs that describe courses of

these study programs. On the other hand, different levels of study programs should be described through different levels of learning outcomes; that is, graduate studies should be described with higher levels of learning outcomes than undergraduate studies.

Since the Bologna Process clearly differentiates between the undergraduate and graduate studies, their goals, intents and differences, the study and the results presented in this paper can serve as a starting point for making a model or a method that objectively measures these differences.

Methods

For the purpose of this study, the authors developed an application and created a database that was used to load the unprocessed data. The first loading step was collecting Bloom's taxonomy active verbs from manuals and reference websites (Clark, 2015; Lončar-Vicković & Dolaček-Alduk 2016; Marinović, 2016; Varošanec, 2015). Bloom's taxonomy was represented by a model that enabled the analysis of verbs by their levels; that is, each verb was associated with its domain and the level within that domain. It is possible that one verb is linked with multiple domains and levels. For example, the verb *compare* can be found both in the cognitive and the affective domain. After this process, the database contained 262 verbs in the cognitive domain, 148 in the affective and 79 verbs in the psychomotor domain.

After the processing of active verbs, the authors loaded the data about the learning outcomes of study programs and courses. These were mostly collected and processed in 2014 as part of the reaccreditation process of the Faculty of Humanities and Social Sciences. Learning outcomes were loaded for 207 study programs and 2,583 courses, so the database contained a total of 2,120 learning outcomes of study programs and 12,917 learning outcomes of courses.

The structure of the learning outcomes by study programs and courses is shown in Table 1, which also shows the number of the learning outcomes depending on the level of study and its type (single major or double major). The Faculty of Humanities and Social Sciences offers three times more double major studies than single major studies, so the ratio of learning outcomes is about 1:3 (556:1,564), while for the courses this ratio is approximately 1:2 (5,555:10,915). The reason is that some of the courses are taught in both types of studies.

Table 1
The structure of learning outcomes

| | Study programs | | | Courses | | |
|--------------|---------------------|----------------|-------|---------------------|----------------|--------|
| | Undergraduate level | Graduate level | Total | Undergraduate level | Graduate level | Total |
| Single major | 196 | 360 | 556 | 2,749 | 2,806 | 5,555 |
| Double major | 563 | 1,001 | 1,564 | 6,243 | 4,672 | 10,915 |
| Total | 759 | 1,361 | | 8,992 | 7,478 | |

A very important step, that has a major impact on further analysis, is associating the learning outcomes with active verbs, that is, linking a level of taxonomy to learning outcomes. Most of the learning outcomes were associated only with one active verb, and in that case, its level is associated with the level of the learning outcome. For example, the outcome *explore interliterary relations* contains one active verb, *to investigate*, which belongs to the fourth level of the cognitive domain and therefore the learning outcome is associated with the fourth level.

There were two exceptions: a case where the learning outcome contained more than one active verb (e.g. *Define and enumerate the basic concepts*), and a case in which the active verb was associated with a greater number of levels (e.g. the verb *used*, which belongs to the third level of the cognitive domain - application, and the fifth level of the affective domain - characterizing). There were more than 5,000 learning outcomes with more than one active verb (the first exception), and less than 100 learning outcomes in the second exception. Both cases were resolved in a way that the learning outcome was apparently divided into as many outcomes as there were active verbs or different levels. Thus, the outcome *define and enumerate the basic concepts* was viewed as two distinct outcomes: *define basic concepts* and *enumerate the basic concepts*, each with its own level and domain.

Table 2 shows the statistics of the processed outcomes of studies and courses. The table indicates that out of 262 loaded verbs for the cognitive domain, 67% were found in at least one learning outcome of studies, and 95% of them in at least one learning outcome of courses. The difference in the coverage is also visible in the affective and psychomotor domains, and is caused by a large difference in the number of outcomes of studies and courses. The highest percentage of learning outcomes of studies and courses belongs to the cognitive domain. From a total of 2,120 learning outcomes of studies, 1,925 were classified into the cognitive domain, and from the total of 12,917 learning outcomes of courses, 10,886 were classified into the cognitive domain.

Table 2
The usage of active verbs and coverage of learning outcomes

| | Defined verbs | Studies | | Courses | |
|----------------|---------------|----------------|-----------------------|----------------|-----------------------|
| | | Used verbs (%) | Outcomes coverage (%) | Used verbs (%) | Outcomes coverage (%) |
| Cognitive d. | 262 | 67.56 | 90.80 | 95.41 | 84.28 |
| Affective d. | 148 | 58.11 | 71.89 | 83.11 | 56.55 |
| Psychomotor d. | 79 | 55.66 | 35.42 | 70.89 | 29.68 |

Results and Discussion

As part of the research, the authors performed three analyses of the learning outcomes, with the aim to identify similarities and differences between the learning outcomes and study programs and their courses, between undergraduate and graduate levels of study, and compulsory and elective courses.

The Difference in the Learning Outcomes between Study Programs and Courses

Courses within study programs are organized as series of teaching units or topics that are taught, with the corresponding number of classes in each section (Marušić, 2010). Since the courses are a part of one or more study programs, the content and level of knowledge that students receive upon the completion of courses should be in accordance with the level of knowledge that students must have after graduation.

One of the main goals of this paper is to determine if there is a difference between the levels of learning outcomes of study programs and the levels of learning outcomes of courses. The analysis was performed in a way that for each level of the taxonomy the authors calculated the total number of learning outcomes of study programs or courses that belong to it. The distribution is shown in the graph in Figure 1. However, in order to provide greater clarity, the graph does not show frequencies, but proportions of the learning outcomes in each level of the taxonomy. The horizontal axis shows the level of learning outcomes and the vertical axis the percentage of individual levels of learning outcomes for courses and studies.

The graph shows that studies place more emphasis on the outcomes (i.e. active verbs) at the fifth and sixth levels of the cognitive domain, whereas the courses place more emphasis on the lower levels, that is, the first and the second. The representation of the third and fourth levels is about equal. In the affective domain, there is a big difference in the first and fifth levels, while other levels are equally represented. It can be observed that the second level of the affective domain, or responding, which involves active participation and motivation of students, is very low for both courses and studies. This level contains only 1.4% of the learning outcomes.

The psychomotor domain is least represented in terms of learning outcomes, as expected, since the observed outcomes describe social and humanistic areas. In this domain there is an equal percentage of the learning outcomes of studies and courses (10%), and although there is some difference in the first level, the overall difference in levels is actually negligible.

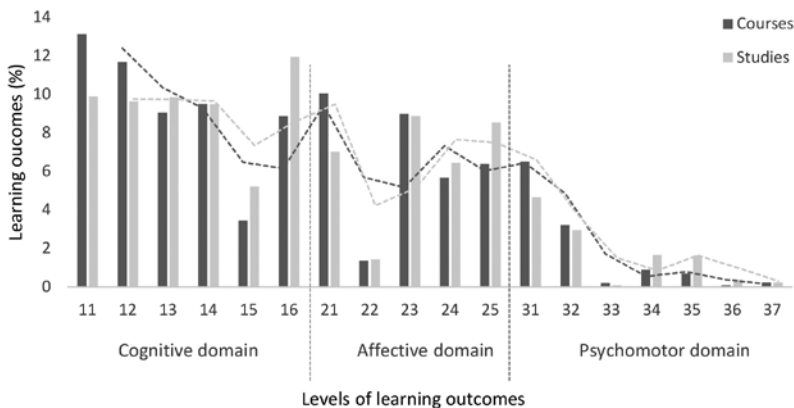


Figure 1. The distribution of the learning outcomes

These differences mean that the competencies that a student gets after passing the courses of study are not in accordance with the competencies that a student obtains after graduation; that is, the competencies listed in the appendix to the diploma. They must be adjusted, but before that, it is necessary to determine the reason for this discrepancy.

These discrepancies were not investigated as part of this paper. One possibility is that the outcomes of courses are incorrectly defined; that is, when defining the learning outcomes of courses, teachers used verbs at lower levels of the cognitive, affective and psychomotor domains than those that were used to define the learning outcomes of studies. The learning outcomes of studies have been defined over a longer period of time and have been revised and verified mainly by the selected working group, while the learning outcomes for the courses were defined by teachers. If this is the reason, it is necessary to adjust the level of verbs. Assuming that the outcomes of the studies are correct, it is necessary to increase the level of verbs for the outcomes of their courses.

Another possibility is that the outcomes have been properly written, both for the studies and their courses. Therefore, it can be concluded that the course curricula do not match the needs of the studies. In this case, the adjustment will probably be complex and long-lasting because it is necessary to change the curriculum to fit the requirements of the studies, followed by redefinition of the learning outcomes. In both cases it is necessary to further educate the teachers and learn more about writing curricula and learning outcomes (Levine, 2006), and to adopt the specific approaches for the assessment and evaluation of the learning outcomes at the institutional level (Shephard, 2008).

In order to determine whether the difference between the frequencies of studies and learning outcomes of courses in each active verb level is statistically significant, the authors performed the chi-square test. The assumed hypothesis was that there is a difference between the frequencies.

Table 3
Chi-square test for frequencies of studies and learning outcomes of courses

| | |
|-------------------------------|-----------|
| χ^2 | 533.74 |
| df | 17 |
| Critical $\chi^2_{0.05} (17)$ | 27.59 |
| p | < 0.00001 |

The result of the chi-square test is shown in Table 3. The test showed that the difference is statistically significant. Based on the sample, the assumed hypothesis can be accepted, i.e. there is a statistically significant difference between the frequencies.

The Difference between Undergraduate and Graduate Studies

The undergraduate level of studies should be formed in a manner to provide a general knowledge of an area, so that students, upon the completion of undergraduate study,

acquire the principles and concepts related to the field of study (Lord & Baviskar, 2007). On the other hand, the graduate level provides highly specialized knowledge and skills that enable students to solve problems, to integrate with other areas and to develop new skills (European Commission, 2015). Therefore, it is expected that the learning outcomes reflect this important difference in the levels of study. The undergraduate level should have softer outcomes, that is, their learning outcomes should be defined by using active verbs at the lower levels of the taxonomy.

As part of the research, the structure of the study programs was analyzed in detail, and for each course it was determined whether it is offered at the undergraduate or graduate level of study. Some courses are offered at both levels, but their number is negligible and they were not included in the analysis. After course classification, the authors calculated the number of outcomes for each level of the taxonomy, for undergraduate and graduate studies respectively, and in that way they formed a distribution by the level of active verbs. For clarity, the graph in Figure 2 does not show the frequencies, but proportions of the level of verbs. The horizontal axis shows the levels and domains of learning outcomes, and the vertical axis the percentage of learning outcomes in a particular level, both for undergraduate and graduate studies.

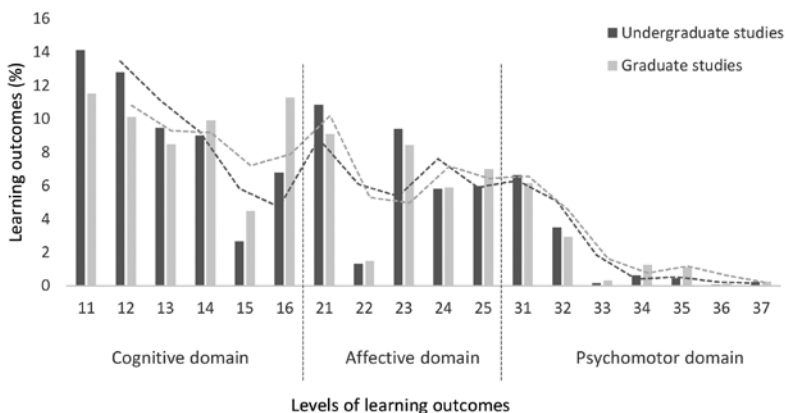


Figure 2. Learning outcomes and the level of studies

The graph shows that in graduate studies higher levels of active verbs are dominant. This is especially emphasized in the cognitive domain, in which graduate studies place more emphasis on the fourth, fifth and sixth levels. The biggest difference determined between the undergraduate and graduate levels of study was 4.5% and was calculated for the sixth level of the cognitive domain (evaluation). The biggest difference in the affective domain was 1.79% and was observed in the first level (receiving). The psychomotor domain shows clearly the biggest match, with the biggest difference of 0.67% in the fifth level (complex overt response). It may be noted that the second level of the affective domain (responding), as well as in the previous analysis, is equally present in both levels of study, but the proportion is very low - 1.3% for undergraduate and 1.4% for the graduate levels of study.

To prove that the difference between the data (that is, between the frequencies of undergraduate and graduate learning outcomes in each active verb level) is statistically significant, the authors performed the chi-square test. The assumed hypothesis was that there is a difference between the frequencies. The result of chi-square test is shown in Table 4.

Table 4
Chi-square test for frequencies of undergraduate and graduate studies

| | |
|------------------------------|-----------|
| χ^2 | 537.72 |
| df | 17 |
| Critical $\chi^2_{0.05}(17)$ | 27.59 |
| p | < 0.00001 |

Based on the results of the chi-square test, it can be concluded that the difference is statistically significant. Based on the sample, the assumed hypothesis can be accepted, i.e. there is a statistically significant difference between the frequencies.

Learning Outcomes and Course Types

As part of the research, the authors performed an analysis of the differences in the learning outcomes between compulsory and elective courses. The curriculum of some studies contains groups of compulsory-elective courses, where the student has to choose one of the courses in the group. Such courses are also categorized as elective courses.

The graph in Figure 3 shows the proportion of individual levels of the verbs in the learning outcomes of mandatory and elective courses. The horizontal axis shows the levels and domains of the learning outcomes, and the vertical axis the percentage of the learning outcomes in each level.

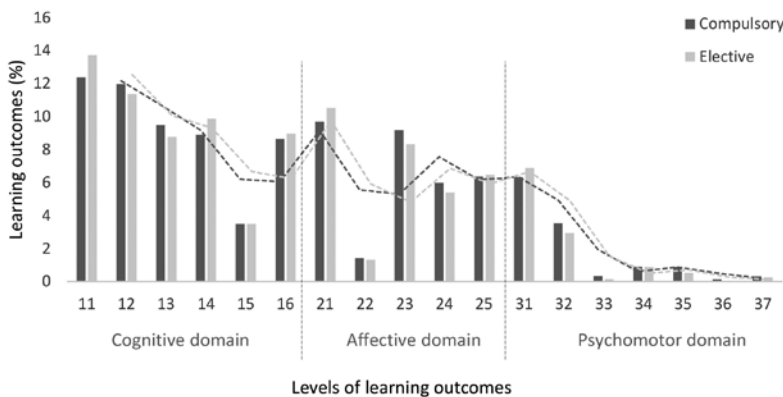


Figure 3. Learning outcomes and course types

The graph shows that compulsory courses are defined by lower levels of the cognitive domain and by higher levels of the affective domain. This makes elective courses

dominant in the cognitive domain, while compulsory courses are dominant in the affective domain. It can be concluded that compulsory courses, on average, emphasize the valuing, organizing and characterizing, while the elective courses emphasize knowledge, especially analysis, evaluation and synthesis (Wu et al., 2010).

Conclusion

The research in this paper is based on the analysis of more than 12,000 learning outcomes and more than 2,500 courses, which are taught within the undergraduate and graduate studies at the Faculty of Humanities and Social Sciences in Zagreb. The analysis considers the relationship between the learning outcomes and levels of the cognitive, affective and psychomotor domains, in order to determine their relationship with the studies and their courses.

The analysis showed that the difference between the studies and courses is statistically significant. The learning outcomes of studies place more emphasis on higher levels of the cognitive, affective and psychomotor domains. This difference should certainly be reduced so that the level of knowledge that students are expected to have upon graduation corresponds to the level of knowledge they receive upon the completion of courses.

Also, it was found that there is a statistically significant difference in the learning outcomes between the courses that are carried out at the undergraduate and graduate level. The results were in line with expectations, and it was found that the learning outcomes of undergraduate studies use the verbs placed at the lower levels of the taxonomy.

The last part of the research observed a difference in the learning outcomes between compulsory and elective courses. It was found that compulsory courses place more emphasis on the affective domain, while elective courses place more emphasis on the cognitive domain.

Further research will be directed to the analysis of the learning outcomes of other institutions that offer studies in the field of social sciences and humanities, in order to identify the similarities and differences with the results of this research.

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Analiza odnosa između ishoda učenja studijskih programa i predmeta

Sažetak

U radu se analiziraju ishodi učenja studijskih programa i predmeta na Filozofskom fakultetu Sveučilišta u Zagrebu te povezuju s razinama Bloomove taksonomije, kako bi se utvrdili njihovi međusobni odnosi. Analiza je pokazala da postoji statistički značajna razlika u razinama ishoda učenja između studija i predmeta koji se na njima izvode. Kod ishoda studija izraženije su više razine kognitivne, afektivne i psihomotoričke domene. Također je utvrđena razlika između predmeta na preddiplomskoj i diplomskoj razini studija, koja je u skladu s očekivanjima jer ishodi učenja na preddiplomskoj razini studija imaju niže razine kognitivne i afektivne domene. Analiza obaveznih i izbornih predmeta pokazala je da je kod izbornih predmeta izraženija kognitivna domena, a da je kod obaveznih predmeta izraženija afektivna domena.

Ključne riječi: Bloomova taksonomija; razina ishoda učenja; usporedba ishoda učenja.

Uvod

Jedna od reformi visokog obrazovanja u Hrvatskoj obuhvaća promjenu u planiranju predmeta i studija, pri čemu se težište pomiče sa sadržaja koji se poučava na studenta koji se podučava, kao i razvoj njegovih vještina, sposobnosti i stavova (Piršl i Ambrosi-Randić, 2010; Lončarić i Pejić Papak, 2009). Ciljevi predmeta su i dalje važni, no oni su pisani iz perspektive nastavnika, a vještine i sposobnosti nastavnika definira sa stajališta studenta. Vještine i sposobnosti ne iskazuju se samo za predmete, već mogu biti definirane i za modul, smjer ili studij, ali moraju biti takvi da se mogu mjeriti ili provjeriti te se iskazuju kao ishodi učenja (Lasić-Lazić i sur., 2012).

Ishodi učenja su izjave o tome što se očekuje da će učenik znati, razumjeti i / ili biti u stanju pokazati nakon završetka procesa učenja (European Commission, 2009). Definiranje ishoda učenja nije trivijalan postupak jer ishodi učenja moraju biti mjerljivi, jasni i dostižni, ali i moraju odgovarati sadržaju kolegija. Nastavnici se uglavnom oslanjaju na priručnike i postojeće modele kako bi im pomogli u postupku planiranja, pripreme i evaluacije (Lončar-Vicković i Dolaček-Alduk, 2016).

Jedan od najkorištenijih teorijskih modela klasifikacije jest Bloomova taksonomija znanja (Orey, 2010). Nastala je sredinom prošlog stoljeća na temelju proučavanja intelektualnih ponašanja uz pomoć kojih studenti stječu akademska znanja (Nimac, 2011). Prema Bloomovoj taksonomiji rezultati podučavanja klasificirani su u tri domene: kognitivnu, afektivnu i psihomotoričku domenu.

Kognitivna domena odnosi se na znanje i razvoj intelektualnih sposobnosti, a uključuje prisjećanje ili prepoznavanje činjenica, obrasce i koncepte koji služe razvoju intelektualnih sposobnosti (Orey, 2010). U kognitivnoj domeni postoji šest razina koje se mogu promatrati kao stupnjevi složenosti: znanje, razumijevanje, primjena, analiza, evaluacija i sinteza. Razine slijede jedna iza druge, odnosno osoba ne može prijeći na sljedeću razinu dok nije savladala prethodnu. Na primjer, student ne može razumjeti neki koncept ako ga prethodno nije zapamtio (Churches, 2008).

Afektivna domena odnosi se na studentove emocionalne reakcije i stavove, a između ostaloga uključuje osjećaje, entuzijazam i motivaciju (Clark, 2015). Domena je podijeljena na pet razina: prihvaćanje, reagiranje, usvajanje vrijednosti, organiziranje vrijednosti i usvajanje sustava vrijednosti. Psihomotorička domena odnosi se na fizičke aktivnosti, koordinaciju i upotrebu motoričkih sposobnosti (Clark, 2015). U toj domeni postoji sedam razina: percepcija, spremnost, vođeni razgovor, automatizirani razgovor, složena operacija, prilagodba i organizacija.

U priručnicima i stručnoj literaturi moguće je za svaku domenu i razinu naći aktivne glagole, odnosno glagole koji izražavaju aktivnost studenta. Aktivni glagoli izrazito su korisni prilikom definiranja ishoda učenja, jer, uglavnom jednoznačno, postavljaju ishod učenja u željenu razinu taksonomije.

U ovom se radu analiziraju aktivni glagoli i ishodi učenja predmeta i studija na Filozofskom fakultetu u Zagrebu. Cilj je rada utvrditi sličnosti i razlike između razina ishoda učenja studija i njihovih predmeta, između predmeta na preddiplomskom i diplomskom studiju, kao i između obaveznih i izbornih predmeta.

Očekuje se da su razine ishoda učenja studijskih programa u skladu s razinama predmeta koji se na njima izvode, odnosno da među njima ne bi trebala postojati primjetna razlika. Ako su studijski programi opisani određenom razinom aktivnih glagola, onda bi trebala postojati jednaka razina aktivnih glagola koji opisuju predmete tih studijskih programa. S druge strane, različite razine studija trebale bi biti opisane s različitim razinama ishoda učenja, pri čemu bi diplomski studiji morali imati višu razinu ishoda učenja nego preddiplomski studiji.

Budući da Bolonjski proces jasno razlikuje preddiplomski i diplomski studij, njihove ciljeve, namjere i razlike, istraživanje i rezultati koji su predstavljeni u ovom radu mogu poslužiti kao polazište za izradu modela ili metode s pomoću kojih je te razlike moguće objektivno izmjeriti.

Metode

Za potrebe istraživanja razvijena je aplikacija i kreirana baza podataka u koju su se najprije učitali neprocesirani podaci. Prvi je korak učitavanja prikupljanje aktivnih

glagola Bloomove taksonomije, za što su se koristili priručnici i referentne mrežne stranice (Clark, 2015; Lončar-Vicković i Dolaček-Alduk 2016; Marinović, 2016; Varošaneć, 2015). Bloomova taksonomija je reprezentirana modelom koji omogućuje analizu prema razinama glagola, odnosno svakom je učitanom glagolu pridružena njegova domena i razina unutar domene. Pritom je naravno moguće da se jednom glagolu pridruži više domena i razina. Na primjer, glagol *usporediti* nalazi se i u kognitivnoj i u afektivnoj domeni. Ukupno su učitana 262 glagola u kognitivnoj domeni, njih 148 u afektivnoj i 79 glagola u psihomotoričkoj domeni.

Nakon aktivnih glagola učitani su ishodi učenja studijskih programa i predmeta, uglavnom prikupljeni i obrađeni 2014. godine kao dio postupka reakreditacije Filozofskog fakulteta. Ishodi su učitani za 207 studija ili smjerova i 2583 predmeta, a ukupno je učitano 2120 ishoda učenja studijskih programa i 12917 ishoda učenja predmeta. Struktura ishoda učenja prema studijskim programima i predmetima prikazana je u Tablici 1.

Tablica 1

Tablica 1 prikazuje strukturu studijskih programa i predmeta, ali i broj ishoda učenja u ovisnosti o razini studija i predmetnosti. Na Filozofskom fakultetu izvodi se tri puta više dvopredmetnih studija (od jednopredmetnih studija), tako da je i omjer ishoda učenja otprilike 1:3 (556:1564), a taj je omjer za predmete otprilike 1:2 (5555:10915). Razlog je u tome što se dio predmeta izvodi na obje varijante studija.

Vrlo važan korak koji ima velik utjecaj na daljnju analizu jest povezivanje ishoda učenja i aktivnih glagola, odnosno pridruživanje razine taksonomije ishodu učenja. Većini ishoda učenja pridružen je jedan aktivni glagol, pri čemu se njegova razina pridružuje razini ishoda. Na primjer, ishod *istražiti međuknjiževne relacije* ima jedan aktivni glagol, *istražiti* koji pripada četvrtoj razini kognitivne domene i zbog toga je navedenom ishodu učenja pridružena razina 4.

Postoje dva iznimna slučaja: slučaj u kojem ishod učenja sadrži više od jednog aktivnog glagola (npr. *definirati i nabrojati osnovne koncepte*) i slučaj u kojem je aktivni glagol pridružen većem broju razina (npr. glagol *primijeniti* koji pripada trećoj razini kognitivne domene – Primjena, i petoj razini afektivne domene – Usvajanje sustava vrijednosti). Oba slučaja razriješena su tako da se ishod učenja prividno podijeli na onoliko ishoda koliko ima aktivnih glagola ili različitih razina. Prema tome, ishod *definirati i nabrojati osnovne koncepte* promatra se kao dva odvojena ishoda: *definirati osnovne koncepte* i *nbrojati osnovne koncepte*, svaki sa svojom razinom i domenom.

Tablica 2 prikazuje statistiku procesiranih ishoda učenja za studije i predmete. Iz tablice je vidljivo da je od ukupno 262 unesena glagola za kognitivnu domenu, njih 67 % pronađeno u barem jednom ishodu učenja studija, odnosno njih 95 % u barem jednom ishodu učenja predmeta. Razlika u pokrivenosti je vidljiva i kod afektivne i psihomotoričke domene, a uzrokovana je velikom razlikom u broju ishoda studija i predmeta. Najveći postotak ishoda studija i predmeta pripada kognitivnoj domeni. Od

ukupno 2120 ishoda učenja studija, njih 1925 kategorizirano je u kognitivnu domenu, a od 12917 ishoda učenja predmeta u kognitivnu je domenu kategorizirano 10886 ishoda.

Tablica 2

Rezultati i rasprava

U sklopu rada napravljene su tri analize ishoda učenja s ciljem utvrđivanja sličnosti i razlika između ishoda učenja studija i predmeta, između preddiplomske i diplomske razine studija, obaveznih i izbornih predmeta.

Razlika u ishodima učenja između studija i predmeta

Predmeti unutar nekog studija organizirani su kao niz nastavnih cjelina ili tema koje se obrađuju, s pripadajućim brojem nastavnih sati za svaku temu (Marušić, 2010). Budući da su predmeti sastavni dio jednog ili više studija, sadržaj i razina znanja koje studenti dobivaju nakon položenog predmeta trebali bi biti u skladu s razinom znanja koju student mora imati nakon završetka studija.

Jedan od osnovnih ciljeva rada jest utvrditi postoji li razlika između razina ishoda učenja studija i razina ishoda učenja predmeta. Analiza je provedena tako da je za svaku razinu taksonomije izračunat ukupan broj ishoda učenja studija, odnosno predmeta, koji joj pripadaju. Distribucija je prikazana na grafu na slici 1, pri čemu, zbog preglednosti, nisu prikazane frekvencije, već udjeli ishoda učenja u pojedinoj razini taksonomije. Horizontalna os prikazuje razine ishoda učenja, a vertikalna postotak pojedine razine učenja za predmete i studije.

Iz grafa je vidljivo da su kod studija dominantniji ishodi (odnosno aktivni glagoli) pete i šeste razine kognitivne domene, a da su kod predmeta dominantnije niže razine, odnosno prva i druga. Zastupljenost treće i četvrte razine je podjednaka. Kod afektivne domene postoji velika razlika u prvoj i petoj razini, a ostale su razine podjednako zastupljene. Može se uočiti da je druga razina afektivne domene, odnosno reagiranje, koja podrazumijeva aktivno sudjelovanje i motivaciju studenata, vrlo niske i za predmete i za studije. U toj razini nalazi se samo 1,4 % ishoda učenja.

Psihomotorička domena najmanje je zastupljena u ishodima učenja, što je i očekivano, budući da se promatraju ishodi učenja iz društvenog i humanističkog područja. U toj domeni nalazi se podjednak postotak ishoda učenja studija i predmeta (10 %), i iako postoji određena razlika u prvoj razini, ukupna razlika u razinama zapravo je zanemariva.

Slika 1

Ove razlike znače da kompetencije koje student dobije nakon što položi predmete na studiju nisu u skladu s kompetencijama dobivenima nakon završenog studija, odnosno kompetencijama navedenima u dodatku diplome, i svakako ih je potrebno uskladiti, ali prije toga je potrebno istražiti zbog čega dolazi do nepodudaranja.

U sklopu rada nije provedeno istraživanje uzroka. Jedna mogućnost je da su ishodi učenja predmeta pogrešno definirani, odnosno da su se prilikom definiranja ishoda

učenja predmeta koristili glagoli nižih razina kognitivne domene (ali i ostalih domena) od onih koji su se koristili za definiranje ishoda učenja studija. Ishodi učenja studija definirani su u dužem razdoblju, revidirani su i provjeravani najčešće od odabrane radne skupine, a ishode učenja za predmete definirao je nastavnik, najčešće nositelj, svaki za svoj predmet. U tom je slučaju potrebno uskladiti razine glagola. Ako se pretpostavi da su ishodi za studij ispravni, potrebno je povećati razinu glagola za ishode predmeta.

Druga je mogućnost da su ishodi ispravno napisani i za studij i za predmete, međutim, tada se može zaključiti da nastavni plan predmeta ne odgovara potrebama studija. U tom je slučaju usklađivanje kompleksnije i dugotrajnije, jer je potrebno mijenjati i nastavni plan, kako bi odgovarao zahtjevima studija, a nakon toga i ponovno definirati ishode učenja. U oba je slučaja nužna dodatna edukacija nastavnika i detaljnije upoznavanje s pisanjem kurikula, nastavnog plana i ishoda učenja (Levine, 2006), ali i usvajanje određenih pristupa za procjenu i evaluaciju ishoda učenja na razini ustanove (Shephard, 2008).

S ciljem da se utvrdi je li razlika u frekvencijama između ishoda učenja studija i predmeta u pojedinoj razini aktivnih glagola statistički značajna, napravljen je hi kvadrat test. Postavljena je hipoteza da postoji razlika među frekvencijama.

Tablica 3

Tablica 3 prikazuje rezultat hi kvadrat testa. Test je pokazao da je razlika statistički značajna. Na temelju promatranog uzorka prihvaća se postavljena hipoteza, odnosno da postoji statistički značajna razlika među frekvencijama.

Razlika između preddiplomskog i diplomskog studija

Preddiplomska razina studija trebala bi biti oblikovana na način da pruži općenito znanje iz nekog područja, odnosno studenti bi završetkom preddiplomskog studija trebali steći principe i koncepte vezane uz područje studiranja (Lord i Baviskar, 2007). S druge strane, diplomatska razina pruža visoko specijalizirano znanje i sposobnosti koje studentima omogućuju rješavanje problema, integraciju s drugim područjima i razvoj novog znanja (European Commission, 2015). Prema tome, može se očekivati da i ishodi učenja odražavaju tu važnu razliku u razinama studija. Preddiplomska razina trebala bi imati blaže ishode, odnosno u definiranju ishoda učenja trebali bi se koristiti aktivni glagoli nižih razina taksonomije.

U sklopu rada detaljno je analizirana struktura studijskih programa, pri čemu je za svaki predmet utvrđeno izvodi li se na preddiplomskoj ili diplomskoj razini studija. Pojedini predmeti izvode se na obje razine, ali je njihov broj zanemariv i nisu uključeni u analizu. Nakon klasificiranja predmeta, izračunat je broj ishoda u pojedinoj razini taksonomije, posebno za preddiplomski i diplomski studij, odnosno dobivena je distribucija prema razinama aktivnih glagola. Graf na slici 2 radi preglednosti ne prikazuje frekvencije, već udjele pojedine razine glagola. Horizontalna os prikazuje razine i domene ishoda učenja, a vertikalna os postotke ishoda učenja u pojedinoj razini, za preddiplomske i diplomatske studije.

Slika 2

Iz grafa je vidljivo da su na diplomskim studijima dominantnije više razine aktivnih glagola. To je najistaknutije u kognitivnoj domeni, u kojoj su diplomski studiji zastupljeniji na četvrtoj, petoj i šestoj razini. Najveća utvrđena razlika između preddiplomske i diplomske razine studija je na šestoj razini kognitivne domene (evaluacija), te iznosi 4,5%. Najveća razlika u afektivnoj domeni uočena je kod prve razine (prihvatanje) i iznosi 1,79%. U psihomotoričkoj je domeni vidljivo najveće poklapanje, a najveća razlika iznosi 0,67% u petoj razini (složena operacija). Može se uočiti da je druga razina afektivne domene (reagiranje), kao i kod prethodne analize, podjednako zastupljena kod obje razine studija, ali je udio vrlo nizak i iznosi 1,3% za preddiplomsku, odnosno 1,4% za diplomsku razinu studija.

Može se zaključiti da su dobiveni podaci u skladu s očekivanim, odnosno da su se u definiranju ishoda preddiplomskog studija koristile niže razine glagola. Kako bi se dokazalo da je razlika statistički značajna, nad podacima, odnosno frekvencijama ishoda učenja preddiplomskih i diplomskih studija u pojedinoj razini aktivnih glagola, proveden je hi kvadrat test. Postavljena je hipoteza da postoji razlika među frekvencijama. Rezultat hi kvadrat testa prikazan je u Tablici 4.

Tablica 4

Na temelju rezultata hi kvadrat testa može se zaključiti da je razlika statistički značajna. Na temelju promatranog uzorka prihvaća se postavljena hipoteza, odnosno da postoji statistički značajna razlika među frekvencijama.

Ishodi učenja i izbornost predmeta

U sklopu rada napravljena je analiza razlike u ishodima učenja između obaveznih i izbornih predmeta na svim studijima. U izvedbenim planovima pojedinih studija definirane su i grupe obaveznih – izbornih predmeta, pri čemu student mora odabrati jedan od kolegija u grupi. Takvi su predmeti također kategorizirani kao izborni predmeti.

Graf na slici 3 prikazuje udjele pojedine razine glagola u ishodima učenja obaveznih, odnosno izbornih predmeta. Horizontalna os prikazuje razine i domene ishoda učenja, a vertikalna os postotke ishoda učenja u pojedinoj razini.

Slika 3

Iz grafa je vidljivo da su obavezni predmeti definirani s nižim razinama glagola kognitivne domene i s višim razinama glagola afektivne domene, zbog čega su izborni predmeti dominantniji u kognitivnoj domeni, a obavezni su predmeti dominantniji u afektivnoj domeni. Može se zaključiti da se kod obaveznih predmeta u prosjeku stavlja jači naglasak na usvajanje i organizaciju vrijednosti i na usvajanje sustava vrijednosti, a da se kod izbornih predmeta više naglašava znanje, posebno analiza, evaluacija i sinteza (Wu i sur., 2010).

Zaključak

Istraživanje provedeno u radu temelji se na analizi više od 12000 ishoda učenja i više od 2500 predmeta koji se izvode u sklopu preddiplomskih i diplomskih studija Filozofskog fakulteta u Zagrebu. U provedenim se analizama razmatra odnos između ishoda učenja i razina kognitivne, afektivne i psihomotoričke domene, s ciljem utvrđivanja njihova odnosa sa studijima i predmetima koji se na njima izvode.

Analiza je pokazala da je razlika između studija i predmeta statistički značajna. Kod ishoda studija izraženije su više razine kognitivne, afektivne i psihomotoričke domene. Tu razliku svakako bi trebalo smanjiti kako bi razina znanja koju studenti očekuju nakon završetka studija odgovarala razini znanja koje dobiju nakon položenih predmeta.

Također, utvrđeno je da postoji statistički značajna razlika u ishodima učenja između predmeta koji se izvode na preddiplomskoj i diplomskoj razini studija. Rezultati su u skladu s očekivanjima, odnosno utvrđeno je da su se kod definiranja ishoda učenja preddiplomskog studija koristili glagoli nižih razina taksonomije.

U posljednjem provedenom istraživanju promatra se razlika u ishodima učenja između obaveznih i izbornih predmeta. Utvrđeno je da je kod obaveznih predmeta dominantnija afektivna, a da je kod izbornih predmeta dominantnija kognitivna domena.

Daljnje istraživanje bit će usmjereno prema analizi ishoda učenja predmeta ostalih institucija na kojima se izvode studiji iz područja društvenih i humanističkih znanosti, te razmatranju sličnosti i razlika s rezultatima ovog istraživanja.