Toward the Development of the Higher Education Sustainability Measurement Scale

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Abstract

In this study, authors analyze sustainability in higher education (HE), including its theoretical dimensions and linkages to the sustainable development goals (SDGs), in order to develop an initial version of the measurement scale, which could be used in research and practical applications in the HE sector. This is of special importance for public business schools wishing to obtain international accreditation, since the majority of international accreditation schemes put emphasis on social responsibility and sustainability of HEI's operations. In addition, the presented approach is linked to demonstrating the impact of public HEIs' contribution to the sustainable development of its broader environment. The empirical part of the study is based on the survey data, obtained from students of a regional public business school in the Republic of Croatia. The initial empirical results show potential dimensions of a measurement scale, which could be used with HEI's stakeholders. In addition, clustering of the obtained student perceptions suggests how an indicative student sample could interpret a HEI's efforts to implement the principles of sustainable development in its operations.

Key words: *higher education; student perceptions; sustainability; sustainability measurement scale.*

Introduction

Over the past two decades, there has been a growing effort by international community and policy makers to incorporate education into global policy initiative directed at sustainable development. This may be linked to the UN Decade (2005-2014) of Education for Sustainable Development (DESD), established by UNESCO in 2002, and launched

in 2004. The focus of DESD was on increasing public awareness and integrating the principles, values and practices of sustainable development into education hoping that *"people around the world [would] recognize that current economic development trends are not sustainable and that public awareness, education and training are keys to moving society toward sustainability"* (UNESCO, 2006, p. 8). Towards the end of the DESD, the UN adopted 17 sustainable development goals (SDGs) among which some researchers and policymakers recognized education for sustainable development as the most vital one of all 17 SDGs. This is related to the role education plays in creating future 'earth-literate' global citizens (Martin and Jucker, 2005), capable of promoting sustainable values, behaviors and attitudes, thus contributing to attaining all of the SDGs.

Higher education especially stands out, with its distinctive potential contribution to sustainability (see Hallinger and Chatpinyakoop, 2019). According to the World Bank (2021), the number of tertiary education students in 2020 was about 220 million, meaning that HEIs directly affect approximately 2.84 % of the world population, which gives them the opportunity to play an important role in the achievement of the SDGs. This can be accomplished in a variety of ways. Firstly, higher education institutions prepare primary and secondary teachers, ensuring they have the knowledge and skills, needed to teach effectively for sustainability. Secondly, university curricula, taught across different disciplines, prepare students for adopting sustainable attitudes and behavior in their lives. Finally, universities act as agents in promoting the principles of sustainability within societies and support global efforts to design sustainable solutions to social and economic problems (Lukman and Glavić, 2007; Cortese, 2003). They could, furthermore, contribute to sustainability by adjusting their internal strategies and policies so that they reflect SDGs (Malešević Perović and Mihaljević Kosor, 2020). Higher education, by creating a highly skilled workforce, plays an important role in achieving economic growth and reducing poverty - educated people have higher productivity, are more employable, they earn more, and cope with economic shocks better. Moreover, HE graduates are typically more environmentally conscious, have healthier habits, and have a higher level of civic participation (World Bank, 2021). HEIs are, thus, educating the next generation of environmentally and socially responsible professionals, in a wide array of contexts (Litttledyke et al. 2013; Rowe, 2010).

Three sustainability dimensions are often investigated in the literature, namely, natural, social and economic. They are related to Elkington's 1994 formulation of the triple bottom line, in which business performance should be measured, in relation to the financial result (economic dimension), environmental impact (natural dimension) and the contribution to the society (social dimension) (Elkington, 2004). This concept differs from traditional reporting frameworks and goes beyond profit maximization/ return on investment, so as to incorporate social and environmental dimensions. This concept encourages the sharing of the Corporate Social Responsibility and sustainability agenda, as it "captures the essence of sustainability by measuring the impact of an organization's activities on the world" (Savitz, 2006, p. 2).

There is a growing literature on the role of higher education in sustainable development. It started in 1998, when the first study appeared (Johnson and Beloff, 1998). A bibliometric review of research on the role of higher education in sustainable development by Hallinger and Chatpinyakoop (2019) found 1459 Scopus-indexed documents, comprised of 27 books, 138 book chapters and 1294 journal articles. The most frequent topics, examined in this stream of literature are: higher education institutions, curriculum development, students, teaching, learning, planning, environmental education, etc. This review also found that scholars from the United States, United Kingdom, Canada and Australia have authored the majority of these studies. Authors from several European countries (Germany, Spain, Netherlands and Sweden) contributed with only 13 % of the identified studies. Such a finding suggests that it may be potentially problematic to implement solutions from one academic environment in another one, as some of the solutions will not be readily transferrable. Along these lines, Stephens and Graham (2010) found that the debates on sustainability in education still lack a cohesive research agenda and a strong theoretical basis.

In the literature review of sustainability in management education, Figueiro and Raufflet (2015) identified the need to position the triple bottom line as the central intellectual basis for analysis of sustainability in management education, in order to prepare students for the 'triple-bottom-line thinking'.

A systematic literature review by Findler et al. (2018) encompasses peer-reviewed journal articles, published between 2005 and 2017. It found 113 articles, examining the effects of HEIs on its stakeholders, economy, society and natural environment. According to their analysis, higher education institutions have an inherent obligation to make societies more sustainable, while higher education plays a vital role in the global effort to achieve SDGs. This finding is supported by the increasing literature on higher education for sustainable development, its multi-disciplinary nature and the quality of journals publishing papers on this topic.

Methodology

As previously discussed, we started with the intention to develop a preliminary measurement scale, based on the stakeholders' perception of sustainability implemented in higher education (HE). In order to avoid inherent shortcomings of case-study based approach to HE sustainability (Corcoran, Walker, & Wals, 2004), it was decided to use the quantitative approach, although on a limited population of students studying at the undergraduate level in a regional business school in Croatia. Out of many potential stakeholders, the choice of the student population is based on the theory review, performed by Alves, Mainardes, & Raposo (2010), who identify students as the essential HE stakeholders, being also the most common subject of academic research.

The three dimensions of sustainability (natural, social, economic) were developed by applying the popular Elkington's (2004) concept of triple bottom line to HE, as well as reviewing the concepts of sustainability, as conceptualized by EFMD (2019) and AACSB (2018) recommendations for international accreditation of business schools. In addition,

we followed the proposition by Larsen (2008), who believes that the sustainability can be achieved only if all of its three dimensions are simultaneously addressed.

The questionnaire items were designed, based on the conceptual book chapter by Clugston & Calder (1999), who proposed several critical dimensions for the implementation of ecological (natural) sustainability in higher education. The selected five items (per each dimension of HE sustainability) included: (a) references to sustainability in HEI's formal documents, including learning objectives; (b) the existence and position of sustainability topics in the HE curriculum; (c) functioning/behavior of the HE institution (HEI), according to the sustainability principles; (d) extra-curricular activities, including special events, related to the promotion of the three dimensions of sustainability; (e) external partnerships and community outreach, related to the promotion of the three dimensions of sustainability. Since the specific HE institution, in which the data collection had been carried out, placed a special emphasis on service learning, enabling students to perform service learning projects at the local civil society institutions and earn additional ECTS points in this way, we included an additional item, related to this specific academic practice. However, it should be noted that the service learning initiative at the analyzed business school is still being implemented as an initial, EU-funded project, and not yet widely accepted and implemented into the regular curriculum.

In analogy with the natural dimension and the interpretation of the social dimension of sustainability in terms of achieving human well-being, democracy and human rights (Magis & Shinn, 2008), we formulated the social sustainability items accordingly. We did not interpret the economic sustainability of HE in terms of its financial performance, but, rather, viewed it as the level at which a HE institution implements the idea of sustainable business, i.e., accepts and promotes Corporate Social Responsibility (CSR).

Our sample consisted of 251 undergraduate students, studying at a regional, but internationally accredited Croatian business school. Since this is a preliminary study, which should demonstrate the potential for further quantitative research of stakeholders' attitudes toward the HE sustainability, we used non-probability sampling. E-mail was used to invite students from all study groups to participate in an anonymous on-line survey, which included the previously described items. SPSS (Statistics Package for Social Science) was used for data analysis.

Results
Descriptive statistics

The sample was composed of 191 female (76.1 %) and 60 male (23.9 %) students, which is one of the most important limitations of the study. Namely, gender has been recognized as a significant factor in students', as well as business professionals' interpretation of ethics-related issues (Ruegger & King, 1992; Peterson, Rhoads, & Vaught, 2001), which calls for additional weighing or stratification of the sample in future research. The mean respondents' age was 22.39 years, with standard deviation

of 1.36. Following the patterns of Croatian HE, the majority of respondents intend to continue studying at the master's level at the same school (86.1 % of valid answers), while 5.8 % would like to continue their studies at another school/university. This is also in line with a rather low mobility of undergraduate students in Croatia, when choosing their master degree. 7.2 % indicated they are still unsure about continuing their studies, while only 0.8 % stated they do not wish to enroll into the master's program.

Some interesting socio-demographic characteristics of the respondents are related to their perception of their social class, with 74.9 % identifying themselves as belonging to the middle class. 6.8 % of the respondents believe their families belong to the upper and 1.2 % to the lower class, while 17.1 % did not wish to answer. We also asked for mother's (61.4 % - secondary and 34.7 % - higher), as well as father's formal education (59.5 % - secondary and 38.1 % - higher). 68.5 % of our respondents held at least one student job during their studies, while 11.6 % owned their own business.

Empirical dimensions of students' sustainability attitudes

The initial measurement scale was rather acceptable from the internal consistency viewpoint, with the Cronbach alpha values of 0.759 for the natural, 0.777 for the social and 0.803 for the economic sustainability subscales.

After screening for outliers, we decided to use the exploratory factor analysis (EFA), as to potentially uncover the additional grouping of sustainability dimensions. A review of the correlation matrix revealed that each of the items correlates with at least one of the other items with the reasonable strength of the relationship (above 0.3), while the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy meets the common requirements (with the value of 0.894, i.e., higher than 0.6). Bartlett's sphericity test has also showed acceptable results ($\chi^2(120) = 2683.32$; Sig. < 0.01), with communalities for items being higher than 0.5, which should provide a decent amount of common variance among items.

We examined an unrotated solution, based on the principal component analysis (PCA). It resulted in the three initial factors, explaining (respectively) 47.27 %, 10.39 % and 7.61 % of the overall variance. The fourth factor contributed with the 7.04 % of variance, which was clearly visible from the scree plot as well. The high loading of all items on the first factor did not enable us to provide any relevant interpretation of the component matrix, which required further analysis of rotated solutions. The Varimax rotation of the loadings revealed that the items related to inter-sectoral co-operation and extra-curricular activities, in all three theoretical dimensions of sustainability (natural, social, economic), loaded on the first factor, along with some elements of HE functioning/behavior. Interpretation of the obtained four-factor solution was still difficult, before introduction of the new measurement items, related to the common measurement of inter-sectoral co-operation and extra-curricular activities in the three dimensions of HE sustainability. The new subscale was created, by using the mean of the original items. The resulting internal consistency for the new, four-item subscales

has been adequate, with the respective Cronbach alpha values (for the natural, social and economic dimensions of sustainability) of 0.704, 0.735 and 0.751.

The Varimax-rotated EFA solution for the four-item sustainability scales was also acceptable from the viewpoint of statistical preconditions (relevant correlations, KMO value of 0.853 and Barlett's test value of $\chi^2(66) = 1989.83$; Sig. < 0.01). In this solution, three factors contributed to the interpretation of 48.61 %, 12.37 % and 9.93 % of variance (respectively), with the fourth factor adding additional 7.78 %. With the declining explanation power, as well as theoretical difficulties in interpreting the fourth (and successive) factor, we decided to retain the three-factor Varimax-rotated solution. Two items (extra-curricular activities/inter-sectoral co-operation, as related to natural sustainability of HE, as well as references to economics sustainability of HE) had cross-loadings (with the value higher than 0.3) on factors one and three. However, the relevant items were retained, due to their strong primary loadings on the first (0.763) and second factor (0.766), respectively.

The obtained factor structure (see Table 1) could be easily interpreted, in terms of: (a) HEI's own functioning/behavior, according to the sustainability principles, including its co-operation with the external stakeholders (partnerships, community outreach and events/campaigns for promotion of sustainability); (b) references to sustainability in HEI's formal documents; (c) sustainability topics in the HE curriculum.

Table 1

Factor loadings for 12 items, measuring three dimensions of HE sustainability (PCA-based, with Varimax rotation)

	Factors		
	1	2	3
HEI behavior-economic	.821		
HEI behavior-social	.789		
HEI extra_curricular-_intersec_coop-social	.780		
HEI behavior-natural	.780		
HEI extra_curricular_intersec_coop-natural	.775		
HEI extra_curricular-intersec_coop-economic	.763		.337
HEI documents-social		.865	
HEI documents-natural		.834	
HEI documents-economic		.766	.319
HEI instruction-social			.816
HEI instruction-economic			.806
HEI instruction-natural			.649
Source: Research results			

Factor scores were computed for each of the three extracted components, using the mean value of the items, primarily loading on each extracted component (factor). We visually examined the distributions of the obtained scores, and performed the Kolmogorov-Smirnov (KS) test, so as to determine their normality. The KS test indicates that the factor scores do not follow the normal distribution (with the D(251) = 0.08, Sig. < 0.01; D(251) = 0.08, Sig. < 0.01; D(251) = 0.06, Sig. < 0.05, for the three factors,

respectively). Therefore, the non-parametric statistical procedures were used in their further analysis.

Relationships with other variables and implications for HEI's sustainable operations

The respondents' socio-demographic characteristics, which were used as control variables in previous studies and which were related to values and social responsibility of HE students in Croatia and Slovenia (see, e.g. Popović & Nedelko, 2018; Alfirević, Nedelko, & Potočan, 2019), proved to be of limited value. None were correlated with the first factor, while the significant, but weak correlations of the second factor (references to sustainability in HEI's formal documents) were found with the respondents' grade average and previous entrepreneurial experience (both positive, measured by the non-parametric, Spearman coefficient of linear correlation). Grades were also positively and significantly correlated with the scores for the third factor (sustainability topics in the HE curriculum), while the negative significant correlations were found for the father's education level and the perception of the respondent's social class. However, all of them were quite weak.

The practice of service learning proved to be a much more useful variable, since its linear correlations (using the Spearman coefficient) with the first factor (HEI's functioning, or behavior) are highly significant (Sig. < 0.01) and of moderate strength (0.58), while the linear relationship with the second factor (references to HEI's documents) is also highly significant (Sig. < 0.01) and of limited strength (0.18). This shows, for the case of the analyzed business school, that the introduction of service learning initiatives can have a significant impact on the institutional aspects of HE sustainability. Probably due to the experimental or project-based introduction of service learning, it has not significantly correlated to the third factor, related to the sustainability in the HE curriculum.

We considered the further exploratory analysis of the factor scores useful for the interpretation of the analyzed HEI's efforts to implement the principles of sustainable development in its operations. In future research, these could reveal some practical implications, which could be generalized across the wider South-East European (SEE) region.

By using the two-step cluster procedure, several clustering solutions were analyzed, with the four-cluster solution being the most appropriate method for interpretation. It consists of clusters, which could be described in terms of: (1) respondents, perceiving HE sustainability to be formalistic, i.e. only mentioned in HEI's documents; (2) respondents with negative perceptions, along all three empirical dimensions of HE sustainability (documents, behavior, academic instruction); (3) respondents with the positive perception of HE sustainability (comparable to the previous cluster) and (4) respondents, who assess HE sustainability positively, in terms of HEI's behavior, including inter-sectoral co-operation and extra-curricular activities. Cluster 1 consists

of 26.3 % of students who responded to our survey, Cluster 2 consists of 12 %, Cluster 3 of 23.5 % and Cluster 4 of 38.2 % students comprising our sample. Figure 1 provides a visual representation of the obtained clusters.

Although the obtained results can be hardly generalized, a similar approach can be used by the regional business schools in order to determine the most promising courses of action, related to their students' perception of HE sustainability.
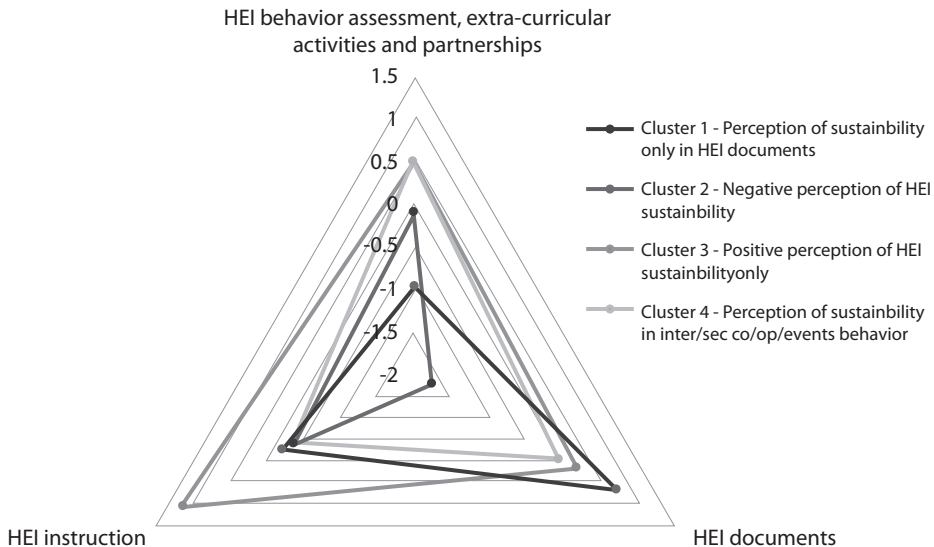

Figure 1. Visual representation of respondent clusters according to their perceptions of HE sustainability

Discussion and future research directions

In this paper, we have examined a measurement scale related to students' perception of HE sustainability and tested its potential usage on the example of a regional, internationally accredited Croatian business school. The scale consists of three empirical dimensions, each containing four items (see Appendix I).

Based on the obtained results, the usage of the proposed measurement scale can be recommended as a starting point for future research, as well as a practical tool for HE leaders. Non-probability sampling of respondents in a single business school limits the generalization of our results and requires a rigorous study to empirically validate the proposed scale. However, we were able to assess the potential relationship between service learning and HE sustainability perceptions, as well as to illustrate the usage of the proposed research instrument in the context of assessing the practical HE sustainability initiatives.

Acknowledgements

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Appendix

Proposed measurement scale for students' perceptions of HE sustainability

Natural dimension of sustainability

1. My institution of higher education highlights the importance of environmental protection in its documents, including the curricula and learning outcomes.
2. During my education at this institution, I have learned about the topics of environmental protection and sustainable development.
3. It was explained to me, or I read a report on how my institution of higher education contributes to environmental protection, i.e. reduces waste, energy usage, etc., during its activities.
4. My institution of higher education informs me and provides opportunities to participate in special events on campus and relate to local businesses, government institutions, or civil society organizations, when it comes to topics of environmental protection and sustainable development.

Social dimension of sustainability

1. My institution of higher education highlights the importance of protecting human rights, social equality and inclusion in its documents, including the curricula and learning outcomes.
2. During my education at this institution, I have learned about the topics of human rights, social equality and inclusion, social capital, poverty reduction, etc.
3. It was explained to me, or I read a report on how my institution of higher education contributes to the protection of human rights, achievement of social equality and inclusion, by relating to its stakeholders, during its activities.

4. My institution of higher education informs me and provides opportunities to participate in special events on campus and relate to local businesses, government institutions, or civil society organizations, when it comes to topics of human rights, social equality and inclusion, etc.

Economic dimension of sustainability

1. My institution of higher education highlights the importance of social responsibility of business in its documents, including the curricula and learning outcomes.
2. During my education at this institution, I have learned about the topics related to the social responsibility of business.
3. It was explained to me, or I read a report on how my institution of higher education uses its ethical principles and values to achieve social responsibility of its activities.
4. My institution of higher education informs me and provides opportunities to participate in special events on campus and relate to local businesses, government institutions, or civil society organizations, when it comes to topics of socially responsible business.

Source: Adapted from Clugston & Calder (1999); Magis & Shinn (2008)

Izrada skale za mjerenje održivosti u visokom obrazovanju

Sažetak

U ovoj studiji autori analiziraju održivost u visokom obrazovanju, uključujući njezine teorijske dimenzije i poveznice s ciljevima održivoga razvoja, kako bi izradili početnu verziju mjerne skale koja bi se mogla koristiti u istraživanjima i praktično primijeniti u sektoru visokoga obrazovanja. To je iznimno važno za državne poslovne škole koje žele dobiti međunarodnu akreditaciju jer se u većini programa za dobivanje međunarodne akreditacije stavlja poseban naglasak na društvenu odgovornost i održivost u aktivnostima visokoškolskih ustanova. Osim toga, prikazani pristup povezan je s načinom na koji se manifestira učinak državnih ustanova visokoga obrazovanja na održivi razvoj u njihovom širem okružju. Empirijski dio studije temelji se na podatcima dobivenima putem ankete koju su popunili studenti iz regionalne državne poslovne škole u Republici Hrvatskoj. Prvi empirijski rezultati pokazuju potencijalne dimenzije mjerne skale koja bi se mogla koristiti s dionicima visokoškolskih ustanova. K tomu, klasteriranje dobivenih percepcija studenata upućuje na to kako bi indikativan uzorak studenata mogao interpretirati nastojanja visokoškolske ustanove da u svojim aktivnostima provede principe održivoga razvoja.

Ključne riječi: *održivost; percepcije studenata; skala za mjerenje održivosti; visoko obrazovanje.*

Uvod

U zadnjih dvadeset godina međunarodna zajednica i donositelji politika ulažu velike napore da obrazovanje uključe u inicijativu globalne politike usmjerene na održivi razvoj. Ti su napori povezani s UN-ovim Desetljećem obrazovanja za održivi razvoj (2005. - 2014.) koji je uspostavio UNESCO 2002., a pokrenuo 2004. godine. U fokusu Desetljeća obrazovanja za održivi razvoj bilo je podizanje razine osviještenosti i integracija principa, vrijednosti i praksi održivoga razvoja u obrazovanje kako bi „ljudi diljem svijeta shvatili da trenutni trendovi ekonomskog razvoja nisu održivi te da su osviještenost javnosti, obrazovanje i edukacija ključni kako bi se društvo približilo održivom razvoju" (UNESCO, 2006, str. 8). Na kraju Desetljeća obrazovanja za održivi razvoj UN je usvojio 17 globalnih ciljeva održivoga razvoja. Među njima su neki istraživači i donositelji politika prepoznali obrazovanje za održivi razvoj kao najvažniji od svih tih 17 ciljeva, jer obrazovanje ima veliku ulogu u stvaranju budućih građana svijeta koji su „ekološki pismeni" (Martin i Jucker, 2005) i koji su sposobni

promicati vrijednosti i stavove održivoga razvoja, ponašati se u skladu s njima te na taj način doprinijeti usvajanju svih globalnih ciljeva održivoga razvoja.

Visoko obrazovanje osobito se ističe zbog svojega posebnog potencijalnog doprinosa održivosti (vidi Hallinger i Chatpinyakoop, 2019). Prema podacima Svjetske banke (2021), 2020. godine na visokoškolskim ustanovama studiralo je 220 milijuna studenata, što znači da visokoškolske ustanove direktno utječu na otprilike 2,84 % svjetske populacije. To im daje priliku da odigraju važnu ulogu u ostvarenju globalnih ciljeva održivoga razvoja, što se može provesti na različite načine. Kao prvo, visokoškolske ustanove pripremaju nastavnike koji će raditi u osnovnom i srednjoškolskom obrazovanju i vode računa o tome da oni steknu znanja i vještine koje su im potrebne za učinkovito poučavanje za održivi razvoj. Nadalje, sveučilišni kurikuli koji se koriste u različitim disciplinama pripremaju studente za usvajanje održivih stavova i ponašanja u svakodnevnom životu. Na kraju, sveučilišta aktivno promoviraju principe održivosti u društvu i podržavaju svjetske napore u osmišljavanju održivih rješenja za društvene i ekonomske probleme (Lukman i Glavić, 2007; Cortese, 2003). Ona bi također mogla doprinijeti održivosti kroz prilagodbu svojih internih strategija i politika tako da one u većoj mjeri odražavaju globalne ciljeve održivoga razvoja (Malešević Perović i Mihaljević Kosor, 2020). Zbog činjenice da stvara visokokvalificiranu radnu snagu, visoko obrazovanje igra važnu ulogu u postizanju ekonomskoga rasta i smanjivanju stope siromaštva – obrazovani ljudi ostvaruju veću produktivnost, lakše se zapošljavaju, zarađuju više i bolje se nose s ekonomskim šokovima. Štoviše, zaposlenici sa sveučilišnom diplomom općenito su ekološki osvješteniji, imaju zdravije navike te veću razinu građanske aktivnosti (Svjetska banka, 2021). Visokoškolske ustanove tako obrazuju sljedeću generaciju ekološki i društveno odgovornih profesionalaca, u raznim kontekstima (Litttledyke i sur. 2013; Rowe, 2010).

U literaturi se uglavnom ispituju tri dimenzije održivosti – ekološka, društvena i ekonomska. One su povezane s Elkingtonovim modelom trostruke bilance iz 1994. godine, prema kojemu bi se ekonomski uspjeh trebao mjeriti s obzirom na financijski rezultat (ekonomska dimenzija), ekološki učinak (ekološka dimenzija) te doprinos društvu (društvena dimenzija) (Elkington, 2004). Ovaj se koncept razlikuje od tradicionalnoga modela izrade izvještaja i nadilazi okvire maksimalnoga profita/povrata ulaganja, kako bi se uključile ekološka i društvena dimenzija. Model potiče i dijeljenje korporativne društvene odgovornosti i programa održivoga razvoja jer „dočarava bit održivosti kroz mjerenje utjecaja aktivnosti neke organizacije na svijet" (Savitz, 2006, str. 2).

Literatura o ulozi visokoga obrazovanja u održivom razvoju postaje sve opsežnija. Radovi o toj temi počeli su se objavljivati 1998. godine kada se pojavila prva studija (Johnson i Beloff, 1998). Bibliometrijski pregled istraživanja o ulozi visokoga obrazovanja u održivom razvoju autora Hallingera i Chatpinyakoopa (2019) rezultirao je brojem od 1459 dokumenata sa Scopus indeksom. Ti su se dokumenti sastojali od 27 knjiga, 138 poglavlja u knjigama i 1294 članka u časopisima. Najčešće istraživane teme u ovoj vrsti literature bile su: visokoškolske ustanove, razvoj kurikula, studenti, nastava, učenje, planiranje, obrazovanje u području ekologije itd. Ovaj je pregled također

pokazao da su znanstvenici iz SAD-a, Ujedinjenoga Kraljevstva, Kanade i Australije proveli većinu tih studija. Znanstvenici iz nekoliko europskih zemalja (Njemačke, Španjolske, Nizozemske i Švedske) doprinijeli su samo s 13 % objavljenih studija. Takvi rezultati upućuju na to da je vjerojatno teško provoditi rješenja dobivena u jednom akademskom okružju u drugome jer se neka rješenja neće moći jednostavno prenijeti. U skladu s time, Stephens i Graham (2010) uočili su da u raspravama o održivom razvoju u obrazovanju još uvijek nedostaju kohezivan program istraživanja i jaka teorijska podloga.

U pregledu literature o održivosti u obrazovanju u području menadžmenta, Figueiro i Raufflet (2015) prepoznali su potrebu da se model trostruke bilance postavi kao središnja intelektualna baza za analizu održivosti u obrazovanju u području menadžmenta, kako bi se studente pripremilo za razmišljanje u skladu s trostrukom bilancom.

Sustavni pregled literature kojega su proveli Findler i sur. (2018) obuhvatio je i recenzirane članke u časopisima, objavljene u razdoblju između 2005. i 2017. godine. Ukupno je pregledano 113 članaka koji su ispitivali utjecaj visokoškolskih ustanova na sve dionike, gospodarstvo, društvo i okoliš. Prema provedenoj analizi, visokoškolske ustanove imaju same po sebi obvezu učiniti društvo održivijim, dok visoko obrazovanje igra važnu ulogu u naporima da se ostvare globalni ciljevi održivoga razvoja na svjetskoj razini. Ovaj rezultat potvrđuje i činjenica da postoji sve opširnija literatura o visokom obrazovanju za održivi razvoj, da je ono multidisciplinarno te da se članci o toj temi objavljuju u kvalitetnim i renomiranim časopisima.

Metodologija

Kako je ranije navedeno, krenuli smo s namjerom da izradimo početnu skalu za mjerenje, na temelju percepcija dionika o tome u kojoj se mjeri održivost provodi u visokom obrazovanju. Kako bi se izbjegli neminovni nedostatci pristupa održivosti u visokom obrazovanju koji se temelji na studiji slučaja (Corcoran, Walker i Wals, 2004), odlučeno je da će se primijeniti kvantitativni pristup iako se radi o ograničenom broju studenata na prijediplomskom studiju u regionalnoj poslovnoj školi u Hrvatskoj. Između mnogih potencijalnih dionika odabrani su studenti, na temelju pregleda teorije koji su proveli Alves, Mainardes i Raposo (2010). Oni smatraju da su studenti ključni dionici visokoga obrazovanja, a ujedno i najčešći predmet akademskih istraživanja.

Tri dimenzije održivosti (ekološka, društvena i ekonomska) nastale su prema popularnom Elkingtonovom (2004) modelu trostruke bilance u visokom obrazovanju i prema pregledu pojmova iz područja održivosti, a u skladu s preporukama za međunarodnu akreditaciju poslovnih škola koje navode EFMD (2019) i AACSB (2018). Osim toga, vodili smo se i Larsenovim (2008) prijedlogom, prema kojemu se održivost može ostvariti samo ako se istovremeno rješavaju njezine sve tri dimenzije.

Sastavljene su tvrdnje koje su korištene u anketi, u skladu s konceptualnim poglavljem u knjizi koje su napisali Clugston i Calder (1999). Oni su predložili nekoliko ključnih dimenzija za implementaciju ekološke održivosti u visokom obrazovanju. Odabranih pet tvrdnji (za svaku dimenziju održivosti u visokom obrazovanju) obuhvatile su:

(a) reference na održivost u službenim dokumentima visokoškolskih ustanova, uključujući i ishode učenja; (b) prisutnost i status tema iz područja održivosti u kurikulima u visokom obrazovanju; (c) funkcioniranje/ponašanje visokoškolske ustanove u skladu s principima održivosti; (d) izvannastavne aktivnosti, koje uključuju i posebna događanja povezana s promidžbom triju dimenzija održivosti te (e) vanjska partnerstva i veze sa zajednicom povezane s promicanjem triju dimenzija održivosti. Kako visokoškolska ustanova u kojoj je provedeno prikupljanje podataka stavlja poseban naglasak na društveno korisno učenje, dajući studentima priliku da se uključe u projekte ustanova lokalnoga civilnog društva i da zarade dodatne ECTS bodove na taj način, uključili smo i dodatnu tvrdnju koja se odnosi na ovu specifičnu akademsku praksu. Međutim, valja napomenuti da se inicijativa za društveno korisno učenje u poslovnoj školi uključenoj u istraživanje još uvijek provodi u početnoj fazi, kao projekt koji financira EU-a te još nije potpuno uključena i provedena u redovnom kurikulu.

Sukladno ekološkoj dimenziji i interpretaciji društvene dimenzije održivosti s obzirom na ostvarivanje ljudskoga dobrostanja, demokracije i ljudskih prava (Magis i Shinn, 2008), formulirali smo i tvrdnje o društvenoj održivosti. Nismo interpretirali ekonomsku održivost u visokom obrazovanju s obzirom na njezine financijske rezultate, nego smo uzeli u obzir razinu na kojoj visokoškolska ustanova provodi ideje održivoga poslovanja, tj. u kojoj mjeri prihvaća i provodi korporativnu društvenu odgovornost.

Naš se uzorak sastojao od 251 studenta prijediplomskoga studija na regionalnoj poslovnoj školi koja ima međunarodnu akreditaciju. Kako je ovo preliminarna studija koja bi trebala pokazati potencijal za daljnja kvalitativna istraživanja o percepcijama dionika o održivosti u visokom obrazovanju, koristili smo neprobabilistički uzorak. Studenti iz svih studijskih grupa pozvani su putem e-pisma na sudjelovanje u anonimnoj *online* anketi, koja je obuhvatila ranije spomenute tvrdnje. Za analizu dobivenih podataka korišten je SPSS programski paket.

Rezultati
Deskriptivna statistika

Uzorak se sastojao od 191 studentice (76,1 %) i 60 studenata (23,9 %), što je jedno od najvažnijih ograničenja ove studije. Naime, spol se smatra najznačajnijim faktorom u interpretaciji etičkih pitanja koja uključuju studente i poslovne ljude (Ruegger i King, 1992; Peterson, Rhoads i Vaught, 2001). Stoga je potrebno u daljnjim istraživanjima dodatno odvagnuti ili stratificirati uzorak. Srednja dob ispitanika bila je 22,39 godina, sa standardnom devijacijom od 1,36. Prema uzorku visokoga obrazovanja u Hrvatskoj, većina ispitanika namjerava nastaviti magistarski studij na istoj ustanovi (86,1 % valjanih odgovora), dok bi ih 5,8 % voljelo nastaviti studij na drugom fakultetu/sveučilištu. Ovi su podatci također u skladu s prilično niskom stopom mobilnosti studenata na prijediplomskim studijima u Hrvatskoj pri odabiru magistarskoga studija. 7,2 % navelo je da još nisu sigurni hoće li nastaviti studij ili ne, dok ih je samo 0,8 % izjavilo da se ne žele upisati na magistarski studij.

Neke zanimljive sociodemografske karakteristike ispitanika povezane su s njihovom percepcijom vlastite društvene klase. Mišljenje je 74,9 % ispitanika da pripadaju srednjoj klasi, 6,8 % ispitanika smatra da njihove obitelji pripadaju višoj, a 1, 2 % nižoj klasi, dok ih je 17,1 % odbilo odgovoriti na to pitanje. Također smo ih pitali o stupnju obrazovanja majke (61,4 % ispitanika izjavilo je da majka ima srednju stručnu spremu, a 34,7 % da majka ima visoku stručnu spremu) i oca (59,5 % ispitanika izjavilo je da otac ima srednju stručnu spremu, a 38,1 % da otac ima visoku stručnu spremu). 68,5 % ispitanika imalo je barem jedan posao tijekom studija, dok ih je 11,6 % imalo vlastitu firmu.

Empirijske dimenzije stavova studenata o održivosti

Početna mjerna skala bila je uglavnom prihvatljiva s obzirom na unutarnju konzistenciju. Vrijednost Cronbachove alfe bila je 0,759 za ekološku, 0,777 za društvenu te 0,803 za ekonomsku podskalu održivosti.

Nakon traženja netipičnih vrijednosti, odlučili smo primijeniti eksploratornu faktorsku analizu kako bismo uočili potencijalna dodatna grupiranja dimenzija održivosti. Pregled matrice korelacije pokazuje da je svaka od navedenih tvrdnji u korelaciji s barem jednom tvrdnjom, s određenom jačinom veze (iznad 0,3), a Kaiser-Meyer-Olkinova mjera primjerenosti uzorka odgovora uobičajenim kriterijima (s vrijednošću od 0,894, tj. većom od 0,6). Bartlettov test sferičnosti također je pokazao prihvatljive rezultate ($\chi^2(120) = 2683,32$; Sig. < 0,01), s komunalitetom za tvrdnje većim od 0,5, što bi također trebalo pokazati dostatnu količinu zajedničke varijance među tvrdnjama.

Ispitali smo nerotirani model, temeljen na analizi glavnih komponenata, što je rezultiralo trima početnim faktorima. Svaki je od njih zasebno objasnio 47,2 %, 10,39 % i 7,61 % ukupne varijance. Četvrti je faktor objasnio 7,04 % varijance, što se jasno može vidjeti iz grafičkoga prikaza. Visoka opterećenja na svim tvrdnjama u sklopu prvoga faktora nisu nam omogućila neka relevantnija tumačenja matrice komponenti jer je to podrazumijevalo daljnju analizu rotiranih modela. Varimaks rotacija opterećenja pokazala je da su tvrdnje povezane sa suradnjom između sektora i s izvannastavnim aktivnostima, u sve tri teorijske dimenzije održivosti (ekološkoj, društvenoj i ekonomskoj) opterećene na prvom faktoru, kao i neki elementi aktivnosti visokoga obrazovanja. Interpretacija dobivenoga modela od četiriju faktora još uvijek je bila otežana prije uvođenja novih tvrdnji za mjerenje, a koje su povezane sa zajedničkim mjerenjima u području suradnje između sektora i izvannastavnih aktivnosti u trima dimenzijama održivosti u visokom obrazovanju. Izrađena je nova podskala pomoću srednjih vrijednosti originalnih tvrdnji. Dobivena unutarnja konzistencija za nove podskale od po četiri tvrdnje bila je primjerena, s pojedinačnim Cronbachovom alfa vrijednostima (za ekološku, društvenu i ekonomsku dimenziju održivosti) od 0,704, 0,735 i 0,751.

Model eksploratorne faktorske analize s varimaks rotacijom za skale održivosti koje se sastoje od četiriju tvrdnji također je bio prihvatljiv, s gledišta statističkih preduvjeta (relevantna korelacija, Kaiser-Meyer-Olkinova vrijednost od 0,853 i

vrijednost Bartlettova testa od $\chi^2(66) = 1989,83$; Sig. < 0,01). U ovome modelu tri su faktora, svaki zasebno, doprinijela interpretaciji 48,61 %, 12,37 % i 9,93 % varijance, dok je četvrti faktor odgovoran za dodatnih 7,78 %. Kako je mogućnost interpretacije u opadanju, a prisutne su i teorijske poteškoće u interpretaciji četvrtoga (i svakoga sljedećeg) faktora, odlučili smo zadržati model od tri faktora s varimaks rotacijom. Dvije tvrdnje (izvannastavne aktivnosti/suradnja između sektora, koje se odnose na ekološku dimenziju u visokom obrazovanju i povezanost s ekonomskom dimenzijom održivosti u visokom obrazovanju) imale su faktorska opterećenja (s vrijednošću većom od 0,3) na prvom i trećem faktoru. Međutim, zadržane su relevantne tvrdnje, zbog jakih primarnih opterećenja na prvom (0,763) i drugom (0,766) faktoru.

Dobivena se faktorska struktura (vidi Tablicu 1) mogla lako interpretirati, s obzirom na: (a) način na koji visokoškolske ustanove provode svoje aktivnosti ili na način na koji se ponašaju, prema principima održivosti, što uključuje i njihovu suradnju s vanjskim dionicima (partnerstva, suradnja s lokalnom zajednicom te događanja/kampanje za promicanje održivosti); (b) reference na održivost u službenim dokumentima visokoškolskih ustanova te (c) teme iz područja održivosti u kurikulima visokoškolskih ustanova.

Tablica 1

Izračunati su rezultati faktorske analize za svaku od tri izdvojene komponente. Pri izračunu su uzete u obzir srednje vrijednosti tvrdnji, prvenstveno opterećenja na svakoj od njih (ili na svakom faktoru). Vizualno smo ispitali distribucije dobivenih rezultata te proveli Kolmogorov-Smirnovljev test kako bismo odredili njihovu normalnost. Rezultati toga testa pokazuju da faktorski rezultati ne prate normalnu distribuciju (s vrijednostima D(251) = 0,08, Sig. < 0,01; D(251) = 0,08, Sig. < 0,01; D(251) = 0,06, Sig. < 0,05, za svaki od tri faktora zasebno). Stoga su u daljnjoj analizi korišteni neparametrijski statistički postupci.

Veze s drugim varijablama i implikacije za održive aktivnosti u visokoškolskim ustanovama

Sociodemografske karakteristike ispitanika, koje su korištene kao kontrolne varijable u ranijim istraživanjima te koje su bile povezane s vrijednostima i društvenom odgovornošću studenata na visokoškolskim ustanovama u Hrvatskoj i Sloveniji (vidi: Popović i Nedelko, 2018; Alfirević, Nedelko i Potočan, 2019), imale su ograničenu vrijednost. Ni jedna nije bila u korelaciji s prvim faktorom, dok su utvrđene značajne, ali slabe korelacije drugoga faktora (reference na održivost u službenim dokumentima visokoškolskih ustanova) s prosjekom ocjena studenata i prethodnim poduzetničkim iskustvom (obje su korelacije bile pozitivne, mjerene neparametrijski, Spearmanovim koeficijentom linearne korelacije). Ocjene su također bile u pozitivnoj i značajnoj korelaciji s rezultatima dobivenima za treći faktor (teme o održivosti u kurikulima visokoškolskih ustanova), dok su utvrđene negativne značajne korelacije između

stupnja obrazovanja oca i percepcije ispitanika o vlastitoj društvenoj klasi. Međutim, sve su one bile dosta slabe.

Pokazalo se da je praksa društveno korisnoga učenja puno korisnija varijabla jer su njezine linearne korelacije (pomoću Spearmanova koeficijenta) s prvim faktorom (načinom na koji visokoškolske ustanove funkcioniraju ili se ponašaju) značajno veće (Sig. < 0,01) i imaju umjerenu jačinu (0,58), dok su linearne veze s drugim faktorom (reference na održivost u službenim dokumentima visokoškolskih ustanova) također jako značajne (Sig. < 0,01) i imaju ograničenu jačinu (0,18). U slučaju analize poslovnih škola, to pokazuje da uvođenje inicijative društveno korisnoga učenja može imati značajan utjecaj na održivost u visokoškolskim ustanovama. Društveno korisno učenje nije bilo u značajnoj korelaciji s trećim faktorom (održivost u kurikulima visokoškolskih ustanova), vjerojatno zbog toga što je uvedeno eksperimentalno ili se provodilo u sklopu projekta.

Smatrali smo da će daljnja ekploratorna faktorska analiza biti korisna pri interpretaciji analiziranih postupaka integracije principa održivoga razvoja u aktivnosti visokoškolskih ustanova. U budućim bi se istraživanjima pomoću njih mogle detektirati neke praktične implikacije koje bi se mogle generalizirati na širem području jugoistočne europske regije.

Tijekom primjene postupka klasterizacije od dva koraka analizirali smo nekoliko modela klasterizacije, od kojih se model od četiri klastera pokazao najprimjerenijom metodom za interpretaciju podataka. On se sastoji od klastera koju se mogu opisati s obzirom na: (1) ispitanike koji smatraju da je održivost u visokom obrazovanju formalna, tj. da se spominje samo u dokumentima visokoškolskih ustanova; (2) ispitanike s negativnim stavovima o svim trima empirijskim dimenzijama održivosti u visokom obrazovanju (dokumentima, ponašanju, nastavi); (3) ispitanike s pozitivnim stavovima o održivosti u visokom obrazovanju (u usporedbi s prethodnim klasterom) te (4) ispitanike koji na pozitivan način gledaju na održivost u visokom obrazovanju, tj. na ponašanje visokoškolskih ustanova, uključujući i suradnju između sektora i izvannastavne aktivnosti. Prvi se klaster sastoji od 26,3 %, drugi klaster od 12 %, treći klaster od 23,5 %, a četvrti klaster od 38,2 % studenata koji su odgovorili na pitanja u našoj anketi. Na Slici 1 može se vidjeti vizualni prikaz dobivenih klastera.

Iako se dobiveni rezultati teško mogu generalizirati, sličan se pristup može koristiti u regionalnim poslovnim školama pri određivanju najuspješnijega načina da se poprave percepcije studenata o održivosti u visokom obrazovanju.

Slika 1

Rasprava i smjernice za buduća istraživanja

U ovome smo radu ispitali skalu za mjerenje percepcija studenata o održivosti u visokom obrazovanju i testirali njezinu moguću primjenu na primjeru regionalne poslovne škole u Hrvatskoj koja ima međunarodnu akreditaciju. Skala se sastoji od triju empirijskih dimenzija, od kojih svaka sadrži četiri tvrdnje (vidi Dodatak I).

Na temelju dobivenih rezultata, upotreba predložene mjerne skale može se preporučiti kao početna točka u budućim istraživanjima i kao praktični alat za voditelje

visokoškolskih ustanova. Neprobabilističko uzorkovanje ispitanika u jednoj poslovnoj školi onemogućava generalizaciju dobivenih rezultata i zahtijeva rigoroznu provjeru kako bi se predložena skala empirijski potvrdila. Međutim, uspjeli smo odrediti potencijalnu vezu između društveno korisnoga učenja i percepcija o održivosti u visokom obrazovanju te ilustrirati upotrebu predloženoga instrumenta istraživanja u kontekstu procjene praktičnih inicijativa za održivost u visokom obrazovanju.

Napomena

Rana verzija ovoga rada prezentirana je na međunarodnoj znanstvenoj konferenciji „Sustainable development goals and economic development: Perspective of the Western Balkan countries", održanom na Ekonomskom fakultetu Univerziteta u Prištini, Kosovo. Istraživanje je potpomogao Znanstveni centar za školsku efektivnost i menadžment.

Prilog

Predložena skala za mjerenje percepcija studenata o održivosti u visokom obrazovanju

Ekološka dimenzija održivosti

1. Moja visokoškolska ustanova naglašava važnost zaštite okoliša u svojim dokumentima, uključujući kurikule i ishode učenja.
2. Tijekom mojega obrazovanja u ovoj ustanovi, puno sam naučio/la o zaštiti okoliša i održivom razvoju.
3. Objašnjeno mi je, ili sam pročitao/la izvješće o tome kako moja visokoškolska ustanova doprinosi zaštiti okoliša, tj. smanjuje količinu otpada, potrošnju energije itd., tijekom svakodnevnih aktivnosti.
4. Moja visokoškolska ustanova informira me o i pruža mi mogućnosti sudjelovanja u posebnim događanjima u kampusu i povezivanja s lokalnim firmama, vladinim institucijama ili organizacijama civilnoga društva, kada se radi o zaštiti okoliša i održivom razvoju.

Društvena dimenzija održivosti

1. Moja visokoškolska ustanova naglašava važnost zaštite ljudskih prava, društvene jednakosti i inkluzije u svojim dokumentima, uključujući kurikule i ishode učenja.
2. Tijekom mojega obrazovanja u ovoj ustanovi, puno sam naučio/la o ljudskim pravima, društvenoj jednakosti i inkluziji, društvenom kapitalu, smanjenju stope siromaštva itd.
3. Objašnjeno mi je, ili sam pročitao/la izvješće o tome kako moja visokoškolska ustanova doprinosi zaštiti ljudskih prava, ostvarivanju društvene jednakosti i inkluzije tako što u svojim aktivnostima izgrađuje veze sa svim dionicima.

4. Moja visokoškolska ustanova informira me o i pruža mi mogućnosti sudjelovanja u posebnim događanjima u kampusu i povezivanja s lokalnim firmama, vladinim institucijama ili organizacijama civilnoga društva, kada se radi o ljudskim pravima, društvenoj jednakosti i inkluziji itd.

Ekonomska dimenzija održivosti

1. Moja visokoškolska ustanova naglašava važnost društvene odgovornosti kompanija u svojim dokumentima, uključujući kurikule i ishode učenja.

2. Tijekom mojega obrazovanja u ovoj ustanovi, puno sam naučio/la o društvenoj odgovornosti kompanija.

3. Objašnjeno mi je, ili sam pročitao/la izvješće o tome kako moja visokoškolska ustanova koristi svoje etičke principe i vrijednosti kako bi postigla društvenu odgovornost u svojim aktivnostima.

4. Moja visokoškolska ustanova informira me o i pruža mi mogućnosti sudjelovanja u posebnim događanjima u kampusu i povezivanja s lokalnim firmama, vladinim institucijama ili organizacijama civilnoga društva, kada se radi o društveno odgovornim kompanijama.

Izvor: Prilagođeno iz: Clugston i Calder (1999); Magis i Shinn (2008)