



The post-Soviet publication landscape for higher education research

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Abstract

We studied the population of articles on higher education published in academic journals by researchers from post-Soviet countries in the last three decades. We found that post-Soviet countries contribute differently to the overall publication output, with only Russia, Lithuania, and Estonia having more than 100 articles in journals indexed in Scopus. Countries also have different publication profiles in terms of articles' language, topics, methodology, and the balance between articles in local and international journals. In comparison with a sample of international articles, post-Soviet authors publish a substantially smaller share of research articles, and articles about teaching and learning issues, student experience and outcomes, and academic work, but a larger share of policy-related articles and articles about system policy and history. Researchers from one post-Soviet country collaborate much less within their country compared with authors from the international sample, where people collaborate more actively between institutions within a country. At the same time, scholars from different post-Soviet countries do not collaborate with each other. Our analysis demonstrates the disunity of the community of post-Soviet scholars disconnected by national borders.

Keywords Higher education research · Post-Soviet countries · Journal articles · Research collaboration · International collaboration · Academic community

Introduction

Higher education has been a growing area of research worldwide in recent decades. Important processes that shape the modern landscape of higher education markets (such as massification,

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the marketization and diversity of higher education institutions, globalization, and internationalization, as well as society's increasing concern about equity, access, and quality assurance) are reflected not only in policy debates but in increasing number of academic publications (see e.g., Kuzhabekova et al. 2015; Steinhardt et al. 2017). The global growth into higher education research has included regions where higher education systems began to actively develop only relatively recently. In particular, there has been a rapid growth in the number of publications on higher education in Asia (Horta and Jung 2014; Jung and Horta 2013, 2015; Jung et al. 2018; Kim et al. 2017; Wai Lo and Kit Ng 2015) and Latin America (Guzmán-Valenzuela 2018; Guzmán-Valenzuela and Gómez 2019; Ordorika and Rodríguez-Gómez 2018).

Countries or regions are distinguished by the structure of their academic systems, the specifics and traditions of the development of higher education, and the modern challenges they are currently facing. For this reason, studies of higher education in different countries or regions differ from each other. Features, problems, and challenges for higher education systems in a given country or region are reflected in what is being researched and how in higher education, since higher education research try to respond to changes and challenges (Gornitzka 2013; Teichler 2005). So, one might expect that dynamics of output in higher education research in country with a changing socio-economic context should reflect these changes.

A good “natural laboratory” to evidence such a longitudinal impact is a post-Soviet region: the collapse of the USSR launched large-scale transformation processes in all aspects of life of 15 independent countries, including the field of higher education. While there are now 15 independent countries, each with its own higher education system, their common past gives reasons to expect some interesting insights from considering these countries with a comparative perspective. At the same time, despite the differences between countries and their particular development trajectories, the 15 former Soviet republics are still often regarded as a specific region (for example, in Scopus, one can find more than 6000 documents with the term “post-Soviet” in the title or abstract). The complexity of transformation processes, the difficulty of their implementation, and the ambiguity of their consequences require an analysis and discussion by the academic and policy community and might be reflected in scholarly publications on higher education research.

The main goal of this study is to provide a thorough analysis of publications in the higher education field in the post-Soviet countries, from the fall of the Soviet Union until today. It is designed to answer two research questions: (1) What are the characteristics of higher education research in the post-Soviet space? and (2) How the features of the academic systems of post-Soviet countries are reflected in their higher education research outputs?

We assume that a consideration of key characteristics of academic research output (related to its content, formats, topics, and type of collaborations that led to the research output) in the broader social and academic context of the region will increase the relevance of the conclusions that may be derived from such an analysis.

Post-Soviet space as an object to study: What we can learn from it?

The standing of the post-Soviet region in the global higher education system is, in a certain sense, controversial. On the one hand, the Soviet Union's higher education system used to represent a large and important part of the higher education world. Just before the Soviet Union's disintegration at the end of the 1980s, its 15 component countries (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine,

and Uzbekistan) together included more than 5 million students and 946 higher education institutions (Smolentseva et al. 2018) with 379,600 faculty members and researchers (Narodnoe obrazovanie i kul'tura v SSSR 1989). Today, with more than 8.5 million students and almost 1500 higher education institutions in these 15 countries, this region represents almost 4% of students and 8% of higher education institutions worldwide. There are academic communities in these countries that study higher education. This is evidenced by the presence of research centers (e.g., ones at the National Research University Higher School of Economics (HSE University), Russia and Nazarbayev University, Kazakhstan), national associations of researchers of higher education (e.g., Russian Educational Research Association, Ukrainian Educational Research Association), and regular conferences on higher education held in the region (e.g., International Russian Higher Education Conference (RHEC)). Researchers from post-Soviet countries are also actively involved in international events, such as Consortium of Higher Education Researchers (CHER) and the Comparative and International Education Society (CIES) Annual Conferences. There is Special Interest Group for Eurasia as a part of CIES, which was founded in 2009 to bring together scholars, researchers, and practitioners concerned with education in Eurasia. The CHER 2018 conference was hosted by HSE University in Moscow. On the other hand, with rare exceptions, the higher education research in the post-Soviet region and its specifics are not actively studied.

Institutional transformations that have taken place in the space to which we now refer as post-Soviet make it important and interesting to evaluate the development of research into higher education in the region. In most of these countries (with the exception of the Baltic states and Ukraine), higher education systems emerged after the Bolshevik revolution of 1917. They were designed and maintained within the centralized Soviet model, with a strong dependence on the center in intellectual and financial resources (David-Fox 1997). This included a common curriculum and standards of teaching and of the training of teachers, as well as centrally planned geographical locations for higher education institutions (Andrews 1978; De Witt 1961). After the collapse of the Soviet Union, its member countries gained or regained their independence, and each began to develop their own higher education system, based on the situation and resources that they institutionally inherited (Balzer 1991). At that time, all 15 countries faced similar challenges: the transition from a planned to a market economy, economic decline, political and social instability, a drop in public funding of education at all levels, a “brain drain” from higher education and research institutions, and in some cases armed conflicts (Smolentseva et al. 2018). This period was marked by the creation of independent national higher education systems and the need to restore a balance between the supply and demand sides in the systems, as well as reconsidering their missions and scope.

Based on the analysis of the transformation of higher education systems in all 15 post-Soviet countries, Smolentseva, Huisman, and Froumin (Smolentseva et al. 2018) argued that the majority of post-Soviet countries implemented a series of important reforms that had a profound impact of the structure of their higher education systems (for country cases, see Allik 2003; Gokhberg et al. 2011; Huisman et al. 2018; Lauk and Allik 2018; Yudkevich 2014). The most fundamental among these included the emergence of private higher education institutions, the introduction of tuition fees in the public sector, university admission reforms (with the introduction of nationally run standardized examinations), and joining the Bologna Process, with a resulting shift from five-year study programs to a “four plus two years” structure for obtaining bachelor and master degrees. In most countries, these reforms have significantly changed previously existed systems and have been ambiguously adopted and widely discussed by both the public and the expert community. These reforms, their implementation, and consequences have also become the subject of research in higher education. Therefore, it can be expected that a substantial proportion of post-Soviet publications in the

field of higher education is devoted to these topics, as well as other topics related to policy-based issues.

Another major reform in higher education (and education in general) was the reform of curricula (Smolentseva et al. 2018). First, the new national educational systems tried to overcome the ideological component of Soviet education. All Soviet students regardless of specialization were required to study ideological courses related to Marxism and the history of the Communist Party and the USSR. These courses have been removed during the transformation and reform of higher education. Second, new educational programs appeared. Soviet higher education was predominantly technical and vocational (e.g., engineering students comprised 43% of the total student population (Huisman et al. 2018)). However, the proportions of educational specialities changed after the collapse of the Soviet Union, because the transition to market mechanisms required more professionals in other fields such as business studies, economics, foreign language studies, and law. The implementation of such educational programs new for post-Soviet countries and the training of students in accordance with them required new approaches and methods, so it can be expected that a substantial proportion of post-Soviet publications in the field of higher education research is also devoted to topics related to curricula and teaching and learning issues.

A characteristic of the Soviet academic system was the separation of research and teaching. Fundamental research was conducted mainly in research institutes within the structure of the Academy of Sciences; applied research was carried out mainly in industry institutes, and higher education institutions were primarily involved in the education and training of personnel (Graham 1992). With large numbers of specialized teacher-training institutions in the Soviet period (later transformed into comprehensive universities), pedagogy as a discipline was quite widespread at that time. Even now, due to path-dependency there is a PhD degree in pedagogy but neither a degree in education nor any training in this field. Those researchers who are interested in higher education research have to struggle to position themselves between pedagogy, economics, psychology, and sociology. Thus, there is a reason to expect that in the post-Soviet higher education research both approaches mentioned above (teaching and learning approach and policy-based approach) will be about equally represented.

Finally, another feature of higher education reform in post-Soviet countries is that the transformation of education systems was largely carried out as an attempt to copy or to transplant the characteristics and practices of “ideal” educational models. The systems of Western countries were considered as such “ideal” models. A significant role in the transformation process was played by international assistance, which involved various European and US government agencies, multilateral institutions, individual universities, and professional associations (Johnson 1996; Smolentseva et al. 2018). They provided both financial and expert assistance in the form of consulting, expertise, and training. Simultaneously, in the 1990s, there were several waves of emigration of researchers from post-Soviet countries. Many researchers left post-Soviet countries in search of earnings and better conditions for academic activity (Ganguli 2014; Gokhberg and Nekipelova 2002; Graham and Dezhina 2008). However, even having ceased to be affiliated with organizations from post-Soviet countries, some of them continued to conduct research and publish articles on post-Soviet education. Given these two circumstances, we can expect a high level of international collaboration in post-Soviet articles on higher education research. At the same time, academic mobility between institutions in the course of a career used to be extremely low and is still rather limited, restricting the experience of faculty and their professional ties with colleagues from other institutions (see e.g., Sivak and Yudkevich 2015; Sologub and Coupé 2015). So, one might

expect rather little cooperation between researchers across different institutions in one country and for articles to be more focused on local practices, experiences, and data rather than comparative issues and general policy trends. We also expect that authors from different post-Soviet countries may have a substantial number of joint articles on higher education. Such an across-country collaboration is expected because of common past and similar ongoing challenges. Russian as a common language (still widespread in a number of post-Soviet countries, particularly as a language of instruction and research) is another stimulating factor.

At the same time, despite the common Soviet legacy, today the academic systems of the post-Soviet countries differ significantly in their features and the context in which they exist and develop. Three countries (Estonia, Latvia, and Lithuania) are now members of the EU, so their academic systems are significantly influenced by the EU's education and science policies. Some post-Soviet countries in Central Asia are, to a large extent, still influenced by the Russian higher education system in terms of training students and faculty, as well as in setting standards for doctoral education.

To sum up, the post-Soviet region as an object of study combines both common characteristics and exogenous variations across 15 countries in highly dynamic context. That creates an opportunity to enrich the analysis of publications in a field of higher education through the lenses of socio-economic context.

Key characteristics of academic publications: Conceptual approach

There is a growing literature on the analysis of the field of higher education research, in particular, through analysis of academic publications (e.g., Daenekindt and Huisman 2020; Horta and Jung 2014; Pan and An 2020). Not to be repetitive here, we will only mention those articles that particularly focus on region-specific studies. Thus, Kim et al. (2017) analyzed publications in specialized journals on higher education of authors from four countries in the Asian region and showed that the thematic structure of publications in these countries differs in terms of the dichotomy of two approaches in higher education research: teaching and learning approach and policy-based approach (for review of these approaches see Horta and Jung 2014; Macfarlane 2012). They explain this difference by the features of the higher education systems of the respective countries and the differences in path-dependent and contextual characteristics (Kim et al. 2017). Thus, specificity and evolution of the higher education research in a country or region that has specific characteristics, history, and is at a certain stage of development should be studied separately.

In our study, we focus on scholarly publications because one of the main attributes of the existence and development of the research area is peer-reviewed research publications. Publication of the results of academic research is an essential element of academic work. Consequently, through the analysis of publications, one can understand what is studied, and how, in a specific field of research, as well as the level of development of this area in the country and the region and its integration into the global disciplinary community. Thus, the processes occurring in the academic systems of post-Soviet countries should be reflected in academic as well as in policy-oriented publications. Several bibliometric studies have analyzed the development of research in the post-Soviet region through the analysis of publications, but they usually focused on selected countries in the region only, and considered either all disciplines or limited their scope to natural sciences, which are historically stronger in this region (e.g., Allik 2003; Fiala and Willett 2015; Gzoyan et al. 2015; Kozak et al. 2015; Kristapsons et al. 2003; Lauk and Allik 2018; Lovakov and Agadullina 2019; Markusova et al.

2009; Zavadskas et al. 2011). As a result, there is a lack of understanding of the research development processes in higher education research in this region.

The key issue in such an analysis is a choice of relevant characteristics of publications (and corresponding journals) to look at (see Fig. 1). Articles on higher education may be published in various journals, which may differ in their localization, language, and subject focus. The ratio of publications of a country or region in different subsamples of journals can provide important information about the status of that country or region, as well as the level of development of the analyzed field in that area. There are several characteristics of journals we consider most relevant in our analysis. Two ones are concerned with *visibility*. First, we divided journals by origin of publication into local and non-local. We chose this criterion assuming that non-local journals probably have greater visibility for the global academic community than local ones. This criterion is based on the evident assumption that a piece published in English has a greater chance of being read by a broad audience compared with an article in another (especially Slavic or Central Asian) language. Clearly, local origin does not necessarily mean local orientation. Higher education research to a large extent is a country-based and context-based field. An element of studies may be more relevant for a particular academic system or country; consequently, authors may wish to publish them in local journals in the local language. Researchers in such a country-based field may also be more interested in building a reputation and accumulating symbolic capital in the local community rather than in the international arena. Thus, articles published in local journals are not necessarily of poor quality or incapable of passing strict peer review, and they can characterize the country's output in the higher education field. That is why we believe that they should also be taken into account in the analysis.

Second, we divided journals into written in English and other languages. *Ceteris paribus*, journals published in English are more visible both for the broader academic community and for potential authors. These journals are able to have broader editorial board and set of

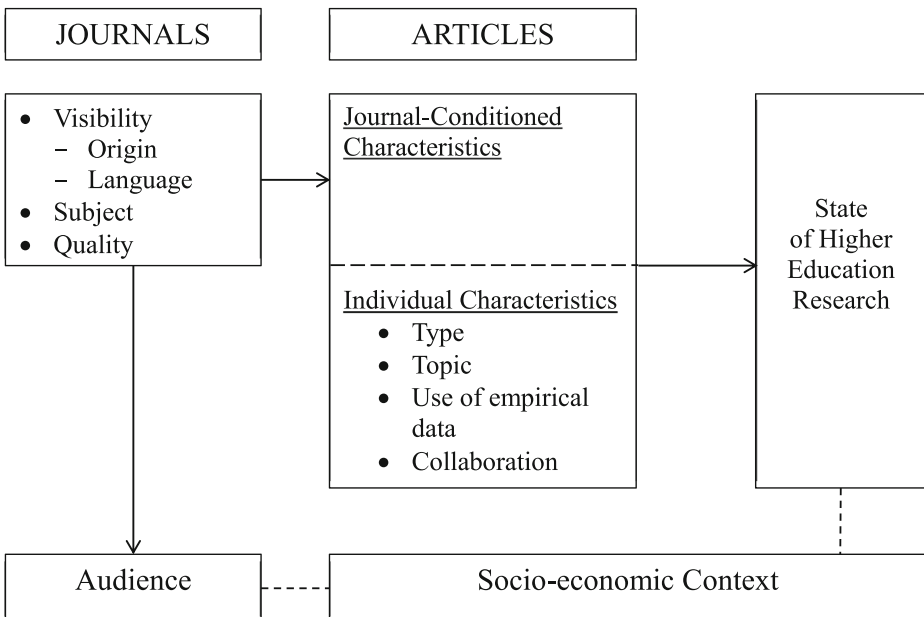


Fig. 1 Characteristics of journals and articles in socio-economic context: conceptual scheme

reviewers and be thus more integrated into the global academic market. Non-English journals have lower chances to be cited. While English as a language does not assure better quality of published articles, it definitely assures higher transparency.

Third characteristic of a journal is a subject area. It affects to a large extent by whom the article will be read and what results (and how) will be further used. The same results placed in a general interest journal may find an audience different from that in more focused journal. Even for educational journals and higher education ones that is true as well. The phenomena chosen for analysis, and approaches and instruments used may differ across these journals as well. Final characteristic in a quality of journal, whether an article will be read, cited by other researchers and used by policymakers and practitioners as a ground for policy recommendations to a large extent depend on what is the quality of the journal (as perceived by academic community).

While emphasized journal characteristics propagate over articles in these journals as well, key characteristics of individual articles may also be distinguished. Thus, looking at the type of article and its topic, one can see what phenomena are in focus of attention, whether such attention tends to be more academic or policy one, and how the problem and corresponding analysis are framed. Then, registering the use of empirical data allows an observer to see what approach to tackle the problem has been chosen and to what extent policy debates reflected in academic literature, are based on sound empirical arguments. Finally, collaboration patterns (whether an article is co-authored and if this co-authorship runs over institutional and country borders) also provide valuable information on the research output and are deeply embedded into social-economic context.

While all these characteristics relate to individual articles, considering at the aggregate level, they provide a sound framework for analysis of higher education research in the region in the dynamic perspective. Our analysis in the “[Data Methodology](#)” section consists of several components. First, we describe the publication output of post-Soviet countries and demonstrate the relative contributions of different countries. We then explain whether post-Soviet publications differ from international ones and, if so, in what respects. We describe collaboration patterns of post-Soviet scholars, both with peers within the region and with those outside. By working with data on the publications of post-Soviet authors, we contribute to an understanding of general trends in higher education research and provide analytical tools that may be used in further analysis of different regions around the world. Then, in the next sections, we provide a thorough discussion of the main findings and make conclusions.

Data and methodology

To address the population of peer-reviewed journals, we considered journals that are indexed in Scopus. By doing so, we ensured a certain level of quality and also potential visibility for non-local readers. Data about higher education articles from post-Soviet countries were retrieved from the Scopus database in December 2016. To build a sample of articles for our analysis, we used several criteria: (1) at least one author must have been affiliated with one of the post-Soviet countries (where an organization from one of the countries is listed as their place of work); (2) “higher education” or “tertiary education” must have appeared in the title, abstract, or keywords; (3) “universit*” must have appeared in the title or keywords; and (4) the date of publication must have been between 1992 and 2017. We also identified all articles with at least one author affiliated with one of the post-Soviet countries in journals about higher education (with the phrases “higher education” or “tertiary education” in the journals’ title). Only “article” and “review” document types, and only “journals” as source type, were considered. Articles from predatory journals were excluded. To do this, we used

two lists of potentially predatory journals. We used the list of Scopus discontinuous titles (as of January 6, 2017) that were excluded by Elsevier and Beall's list (version August 30, 2016) (Sterligov and Savina 2016), and we assumed that this search query would cover most of the articles on higher education.

Our initial search revealed 2049 articles. We then estimated the relevance of each article and identified a number of papers with “higher education” or “university” in the title or abstract but which are not in fact related to higher education. Examples include (1) studies of smoking behavior of youth where higher education is considered an exogenous factor, (2) biological research that mentions a particular university in the description of an experimental sample, and (3) studies of various areas that refer to people with higher education in the description of the research sample. We excluded all those articles that were not about higher education. To do so, each co-author independently read all abstracts and selected those that did not seem relevant. These, which were initially marked by both co-authors, were excluded, while those marked by only one researcher were carefully read in full-text versions by both co-authors and then discussed. We excluded articles that were not authored by researchers from post-Soviet countries but were included in the initial sample due to different types of homonyms (for example, there were some papers affiliated with the US state of Georgia rather than the country of the same name). We also excluded texts that are short notes describing the history of a department or university or a biography of a particular scientist, written in connection with an anniversary or death (the practice of celebrating anniversaries of particular scientists, institutions, and events goes back to early Soviet history, see Kremontsov 1996, p. 52). The final sample consisted of 1044 articles. Each one was processed in accordance with the coding procedure, within the framework of which its characteristics—such as type, topic, composition of authors, features of empirical data, and also features of the journal in which the article was published—were determined. The exact characteristics for all articles in the sample were assigned on the basis of manual analysis of the full-text version of the article. In those rare cases where full texts were not available (123 articles, 11.8% of the total), analysis was based on the information from abstract, keywords, and title, if possible.

Journal typology

Articles presented in our sample were published in journals in different regions across the world. As for journal visibility, substantial share (45%) were published in post-Soviet countries (with Russia being the leader in the region), and we attribute these journals to local ones. However, a considerable proportion (30%) were published in journals in Western and central Europe, and substantially fewer represented journals from North America, Australia, Eastern Europe, and the rest of the world—these we called non-local. Second, to use the language of the journal as a criterion, we divide journals into those that publish articles in English and those that use other languages. In our sample, the splits between local and non-local journals and between English and non-English ones do not match completely, as 35% of the articles published in local journals that choose English as a language of publications.

While classifying journals into several categories by subject area, we distributed them into one of *General interest* (with journals from the Scopus subject categories of Sociology, Arts and Humanities, Social Sciences, and Economics and Econometrics); *Educational journals* (listed in Scopus under the category Education); *Higher education journals*

(devoted specifically to higher education); and other *special non-educational journals* (such as the Journal of Analytical Chemistry and the Baltic Journal of Management that occasionally publish articles on higher education issues in corresponding industries). As a proxy for quality, we identified *Q1 journals*—those included in the top 25% in at least in one category according to the SCImago Journal Rank 2016 data (SCImago n.d.).

Article characteristics

For each article in our sample, the set of important characteristics (discussed in the previous section) has been determined:

Type of article Articles were classified into the following types: *Research article* (either a description of empirical research or a theoretical article which develops a specific concept using an analytical/theoretical framework); *Methodology of teaching article* (provides a description of the methodology for teaching a discipline, as well as tools or techniques useful in the teaching process); and *Policy article* (presents an expert opinion on the functioning or reform of the management of higher education).

Topic of the article Our thematic analysis was based on the research thematic framework developed by Tight (2004), who identified eight themes: Teaching and learning; Course design; Student experience; Quality; System policy; Institutional management; Academic work; and Knowledge. However, we merged the first two themes into one category, and slightly renamed the categories covering the student experience (Student experience and Outcomes) and knowledge (Knowledge and research). Following Horta and Jung (2014), we added internationalization as a theme due to the increasing number of publications on this subject. We also added a History category due to the substantial number of articles on this subject in our sample. Articles that did not fit into any of these topics were classified under the category Other (see Table 5 in Appendix for description of the topics). When it was hard to classify the article into one topic, only two relevant topics were assigned for the article. Based on the topics attributed to the articles, we also combined them into two general approaches in higher education research: teaching and learning, and policy-based. Articles with the topics Teaching and learning + Course design and Student experience and outcomes were assigned to the Teaching and learning approach, and articles with the topics Quality, Institutional management, Academic work, Knowledge and research, Internationalization were assigned to the Policy-based approach.

The articles were also classified as either based or not based on empirical data. If an article was based on empirical data, then the type of data (quantitative, qualitative), level (micro, macro) and type of analysis (descriptive (means, percentages), or analytical (multivariate methods, model-based data analysis)) were determined.

Collaboration patterns For analysis of the collaboration patterns, we divided all articles from the post-Soviet and international samples into four groups: (1) zero collaboration—single-author articles; (2) institutional collaboration—articles with collaboration within one organization (more than one author but only one affiliation and country); (3) national collaboration—articles with collaboration within one country (more than one author, more than one affiliation but only one country), and (4) international collaboration—articles with international collaboration (more than one author and country).

Sample of international articles for comparison

To have a benchmark for comparison and to be able to see whether “post-Soviet articles” differ from “typical articles” in the higher education field, we constructed a sample of “international articles.” For this purpose, we selected 31 journals (see [Appendix](#)) that met two conditions: (1) they had to have the words “higher education” or “tertiary education” in the title, and (2) they had to have Q3 or higher in at least one category (based on the SCImago Journal Rank 2016 data (SCImago n.d.)). From these journals, we randomly selected 500 articles published between 2011 and 2016 (more than 70% of post-Soviet articles from our sample were published during this period). Based on full-text analysis, these articles were coded according to the same procedure as post-Soviet ones. After coding, 15 articles were excluded because of inappropriate type (editorial, introduction to special issue, etc.). Hereafter, we will refer to the remaining 485 articles as international ones and will provide some comparisons on articles and their various characteristics from our post-Soviet sample and international samples.

Results

Description of the dataset

We identified 1044 articles, which represent three decades of higher education research in the post-Soviet region. As well as a growth in total research output (measured in articles in peer-review journals) in recent years, there has also been a growth of the share of articles related to higher education (starting from fewer than 1 paper per 1000 during the 1990s and 2000s and reaching almost 3 papers per 1000 in 2016, see [Fig. 2](#)). A clear trend was observed for the number of post-Soviet articles in journals from all origins to increase each year ([Fig. 2](#)). A substantial part of the underlying dynamic can be attributed to local journals, while those from North America, Australia, and Eastern Europe have shown the smallest growth. This growth is associated with a positive dynamic across all subject areas ([Fig. 2](#)). About a half of all output was published in educational journals. The smallest number of articles and the slowest growth were observed in general interest journals. Most articles were either in English (about 70%, with more than two-thirds published in non-local journals) or in Russian (21%, almost all published in local journals), with the remaining articles published in other languages. The number of articles in English increased at a faster rate over the years than those in other languages ([Fig. 2](#)), though these also increased in number. The decrease observed in 2016 was most likely due to incomplete indexing of issues for 2016 at the time of the search, which might have affected non-English journals more. Titles of journals with the highest number of articles and detailed descriptions of the articles’ languages can be seen in [Appendix \(Tables 6, and 7\)](#).

Contribution of countries

Only three countries (Russia, Lithuania, and Estonia) had more than 100 articles in the period under consideration, and only six (the previous three plus Ukraine, Latvia, and Kazakhstan) had ten or more. Nine countries had fewer than ten articles: Armenia (9), Belarus (8), Georgia (8), Kyrgyzstan (6), Azerbaijan (5), Moldova (4), and Uzbekistan (2). Tajikistan and Turkmenistan had no articles. When the size of each country’s research sector was taken into account, we saw that Estonia had 18.81 articles per 1000 people engaged in research and development, Lithuania

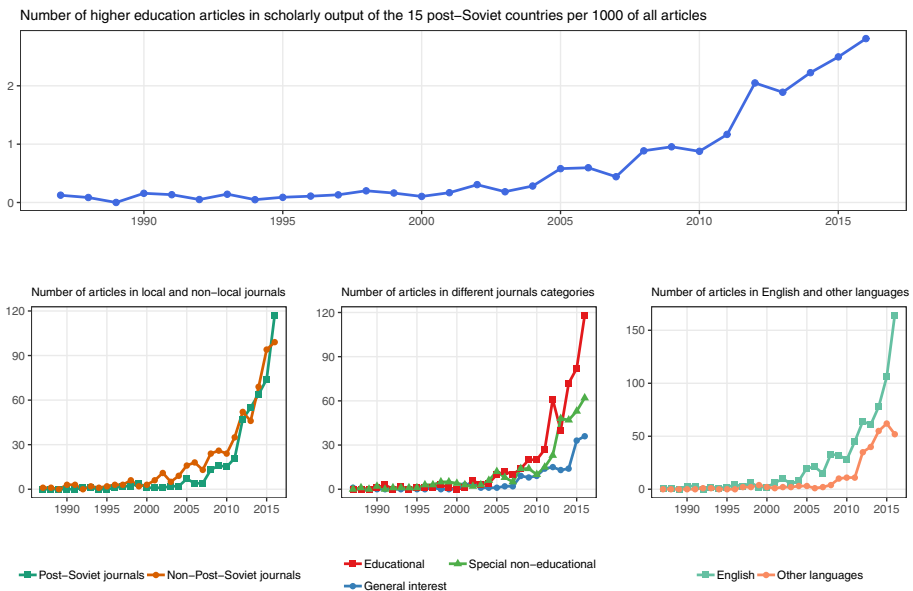


Fig. 2 Trends of articles about higher education from 15 post-Soviet countries

15.97, and Latvia 8.44. With the largest absolute number of articles, Russia had the lowest number of articles (0.74) per 1000 people engaged in research and development.

Countries also had different publication profiles (Table 1). Among articles by authors with Russian or Lithuanian affiliations, one-half or fewer were published in local journals and about 60% were in English, whereas among articles which include authors with Estonian affiliation, only 20% were published in local journals and almost all were in English. Estonia and Kazakhstan had the higher share of high-quality output (measured in the share of articles in Q1 journals), whereas Latvia, Ukraine, and Russia had the lowest. To ensure that this output is not driven solely by the activity of a small number of researchers with large number of publications, we analyzed the number of unique authors of articles in high-quality journals from Estonia and Kazakhstan. Forty of these articles from Estonia were written by 50 unique authors (affiliated both with Estonia and with other countries). Only one of these 50 authors was listed as a co-author in four articles while others published two at most. A similar picture is true for Kazakhstan and for the rest of the countries with a considerable amount of Q1 output. Thus, the regional product in high-quality journals is indeed presented by a large number of authors.

Paper types and themes

One Russian journal (*Teoriya i Praktika Fizicheskoy Kultury* (Theory and Practice of Physical Culture)) added more articles to our sample compared with other journals (125, or 12.0% of all papers). We removed it from further analysis, since it is dedicated to one particular topic, and the large number of articles from it could have distorted the overall picture. Further analysis was based on the remaining sample of 919 articles.

Comparison of types for post-Soviet and international articles (Fig. 3a) demonstrated that post-Soviet authors published a substantially smaller share of Research articles (48.7% in the post-Soviet sample against 66.4% in the international sample) and a larger share of Policy-type

Table 1 Number of articles in different journals by countries

Countries	N (%) of articles	N of articles per 1000 persons from R&D	Percent of articles in English	Percent of articles in non-local journals	Percent of articles in general interest journals		Percent of articles in educational journals		Percent of special non-educ. Journals	Percent of articles in HE journals	Percent of articles in Q1 journals	
					English	Other	English	Other				
Russia	595 (57.0)	0.74	63.9	51.8	8.6	4.7	36.5	17.6	18.8	13.8	4.2	13.4
Lithuania	168 (16.1)	15.97	61.3	33.9	16.1	7.1	22.0	23.2	23.2	8.3	4.2	16.7
Estonia	106 (10.2)	18.81	96.2	81.1	17.9	0	37.7	0.9	40.6	2.8	17.0	33.0
Ukraine	80 (7.7)	0.98	76.2	70.0	11.2	8.8	35.0	0	30.0	15.0	5.0	16.2
Latvia	47 (4.5)	8.44	100	76.6	23.4	0	51.1	0	25.5	0	8.5	10.6
Kazakhstan	39 (3.7)	2.22	100	92.3	5.1	0	76.9	0	17.9	0	15.4	35.9

The table shows only countries with 10 or more articles. Data about number of persons engaged in research and development in 2016 are taken from Gorodnikova et al. (2018) *HE journals* journals focused on higher education, *Q1 journals* journals included in the first quartile in at least one category

articles (36.2% in the post-Soviet sample against 22.7% in the international sample). The Methodology of teaching types of articles were equally less present in both samples (14.2% in the post-Soviet sample and 8.9% in the international sample). More than half the post-Soviet articles published in special journals about higher education (63.8%), and in high-quality journals (66.3%) were Research articles, whereas the percentage of Research articles in the whole sample was only 48.7% (Table 2).

The shares of articles of different types among the three leading countries were not the same (Fig. 3b). Estonian authors had the largest percentage of Research articles (75.2%). Every second article (54.1%) in the Lithuanian output was a Research one, and only 36.5% in the Russian output. These three countries also differed in the share of Policy-type articles. While among Lithuanian and Russian articles, more than one-third were Policy-type articles (36.7% and 40.5%, respectively); only 10.9% of articles in the Estonian output fell into this category.

Analysis of articles' topics (Fig. 4a) shows that there was less interest among post-Soviet papers towards teaching and learning issues compared with the international sample (25.1% in the post-Soviet sample against 33.8% in the international sample), student experience and outcomes (14.8% against 24.5%), and academic work (6.4% against 10.1%). There was also greater interest among post-Soviet authors towards system policy (24.3% in the post-Soviet sample against 11.5% in the international sample) and history (5.8% against 0.8%). In both samples, surprisingly little attention to quality, internationalization, knowledge, and research was seen.

Teaching and learning, as well as system policy, were the most popular topics among post-Soviet authors. These two topics were the most frequently occurring in the majority of subsamples and journal types (Table 3). However, articles about teaching and learning issues were less represented in general interest journals and more represented in educational journals or special non-educational ones. Articles about system policy were more widely represented in general interest, educational, and special higher educational journals; those about history issues were mostly concentrated in non-English special non-educational journals.

The profiles of the three leading countries in terms of the distribution of the subjects of articles exhibited both similarities and differences (Fig. 4b). For all three countries, one of the most frequently encountered topics was teaching and learning (from 20.4% to 25.1%). All three countries had approximately the same (quite small) percentage of articles on the topic of knowledge and research (from 3.8 to 7.1%) and institutional management (from 11.9 to 13.9%). At the same time, among Estonian articles, there were more pieces about students

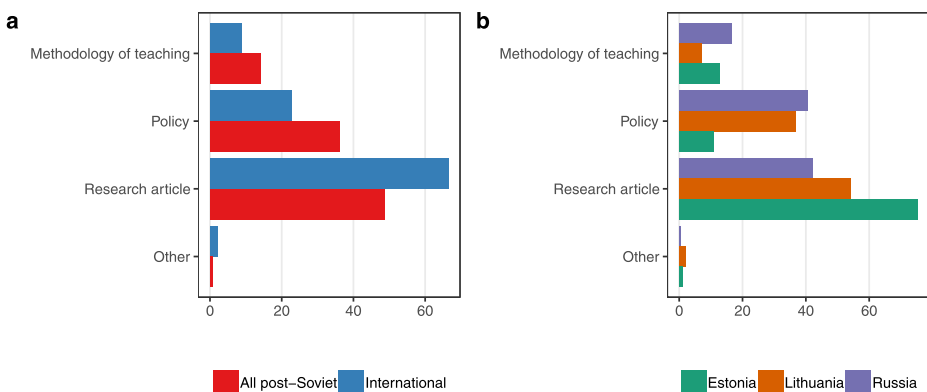


Fig. 3 Article types among (a) post-Soviet and international articles and (b) among Estonian, Lithuanian, and Russian articles separately (%)

Table 2 Percentage of articles with different types across different subsamples

	All articles	Percent of articles in local journals	Percent of articles in non-local journals	Percent of articles in English	Percent of non-English articles	Percent of articles in HE journals	Percent of articles in Q1 journals
<i>N</i>	745	203	542	647	98	69	166
Methodology of teaching	14.2	13.8	14.4	14.5	12.2	4.3	9.6
Policy	36.2	41.9	34.1	35.1	43.9	31.9	23.5
Research article	48.7	42.9	50.9	49.8	41.8	63.8	66.3
Other	0.8	1.5	0.6	0.6	2.0	0	0.6

and academic work, but fewer articles about system policy, compared with Russian and Lithuanian articles. Lithuanian authors also paid more attention to the topics of quality and internationalization, and Russian ones to history. The share of articles about quality is as high among Lithuanian articles compared with those from Estonia and Russia.

In terms of two general approaches in higher education research (teaching and learning approach and policy-based approach) most of the articles from post-Soviet countries refer to a policy-based approach; however, the difference in the shares of articles of those two approaches is not particularly large yet significant (41.8% vs 58.2%). Thus, both approaches are presented in post-Soviet countries. A policy-based approach also prevails at the country level. The largest imbalance between the approaches is observed in articles from Lithuania (33.3% vs 66.7%). In articles from Estonia and Russia, the ratio of the two approaches is more balanced (45.4% vs 54.6% and 43.3% vs 56.7%, respectively).

Collaboration patterns

The majority of the post-Soviet papers in higher education were written in collaboration. Only one of every three papers in our samples (both post-Soviet and international) was single-authored. Researchers from post-Soviet countries collaborated much less inside their country compared with authors from the international sample, where people collaborated more actively

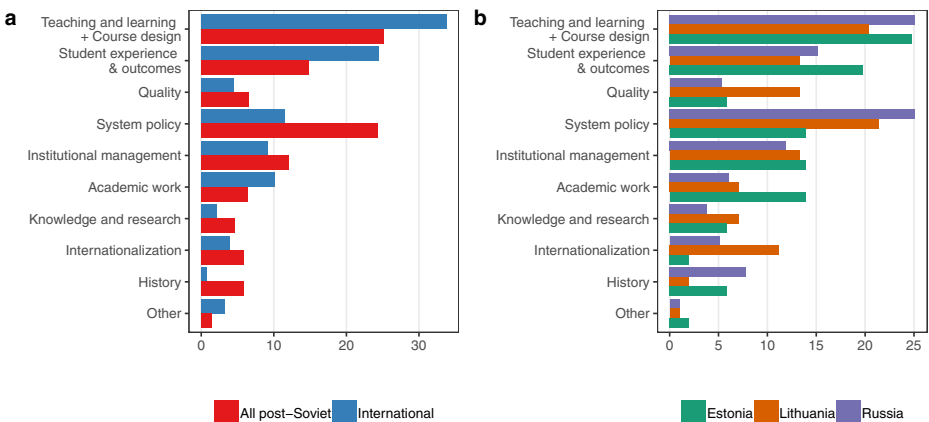


Fig. 4 Article themes (a) among post-Soviet and international articles and (b) among Estonian, Lithuanian, and Russian articles separately (%)

Table 3 Percentage of articles with different themes in different journals

	All articles		Articles in English		Non-English articles		Articles in local journals		Articles in non-local journals		Articles in general interest journals		Articles in educational journals		Articles in special non-educ. Journals		Articles in HE journals		Articles in Q1 journals	
	N	745	647	98	204	15.3	203	542	25.8	15.1	111	34	320	20	216	44	69	166	21.1	12.7
Teaching and learning + course design		14.8	14.7	15.3	13.8	13.8	15.1	12.6	23.5	17.8	5.0	11.1	13.6	11.6	12.7	13.6	11.6	12.7	13.6	11.6
Student experience and outcomes		6.6	6.3	8.2	8.4	8.4	5.9	6.3	8.8	6.2	5.0	6.5	9.1	10.1	4.8	9.1	10.1	4.8	9.1	10.1
System policy		24.3	25.2	18.4	20.2	20.2	25.8	28.8	32.4	29.1	15.0	17.6	9.1	30.4	21.1	9.1	30.4	21.1	9.1	30.4
Institutional management		12.1	12.2	11.2	15.3	15.3	10.9	15.3	26.5	8.1	5.0	16.7	2.3	13.0	9.6	2.3	13.0	9.6	2.3	13.0
Academic work		6.4	6.5	6.1	5.9	5.9	6.6	7.2	8.8	7.8	0	4.2	6.8	10.1	7.2	6.8	10.1	7.2	6.8	10.1
Knowledge and research		4.6	5.1	1.0	4.4	4.4	4.6	8.1	0	2.5	0	7.4	2.3	4.3	10.2	2.3	4.3	10.2	2.3	4.3
Internationalization		5.8	6.2	3.1	3.4	3.4	6.6	7.2	5.9	9.1	5.0	1.4	0	5.8	7.8	0	5.8	7.8	0	5.8
History		5.8	3.4	21.4	10.8	10.8	3.9	2.7	2.9	1.9	0	6.0	45.5	2.9	12.0	6.0	45.5	2.9	12.0	6.0
Other		1.5	1.7	0	1.0	1.0	1.7	3.6	0	0.6	0	2.3	0	0	1.2	2.3	0	1.2	2.3	0

between institutions within one country (17.8% vs 31.5%, see Fig. 5a). At the same time, they collaborated more often with international colleagues (20.3% vs 11.3%).

A large share of post-Soviet output was represented by articles that were written by a single author or by several authors from one institution. Single-authored articles were more represented among non-English articles and less represented among higher education journals and Q1 journals (Table 4), whereas articles written in collaboration with international colleagues were overrepresented among higher education journals and Q1 journals and practically absent among non-English articles and local journals.

International collaboration increased over time for all categories of articles (whole sample, local, high-quality, and non-local), while the share of articles with one author or authors working at one institution declined. International collaboration exhibited higher growth in the high-quality segment from the 1990s to the 2010s, from 0 to almost 50%, and from 0 to almost 25% for all articles. International collaborations more frequently produced research articles, whereas single authors more frequently produced articles of policy type (see Table 8 in Appendix).

A comparison of the three countries in their collaboration patterns showed that Russia was different from Estonia and Lithuania, but these were similar to each other (see Fig. 5b). Among Russian articles, there was almost twice as large a share of single-author articles (35.9% vs 18.8% and 18.4% among the Estonian and Lithuanian articles respectively) and almost twice as small a share of articles with international collaboration (17.7% vs 33.7% and 30.6% among the Estonian and Lithuanian articles).

An important and somewhat surprising finding is that scholars from different post-Soviet countries practically do not collaborate with each other. Only 19 articles were written by authors from two or more post-Soviet countries. Moreover, 13 of them were published in 2015–16, and there were no such articles published earlier than 2007. A typical article from these 19 is written by authors from two or three countries only. Often, these are Baltic countries, but Kazakhstan, Russia, and Ukraine also appear. The articles often analyze or compare the countries with which the authors are affiliated, but this is not always the case.

Characteristics of the empirical papers

Among all the papers, those based on empirical data are of particular interest. While other papers are, in line with the Soviet tradition in social sciences, often based on opinion rather than an analytical

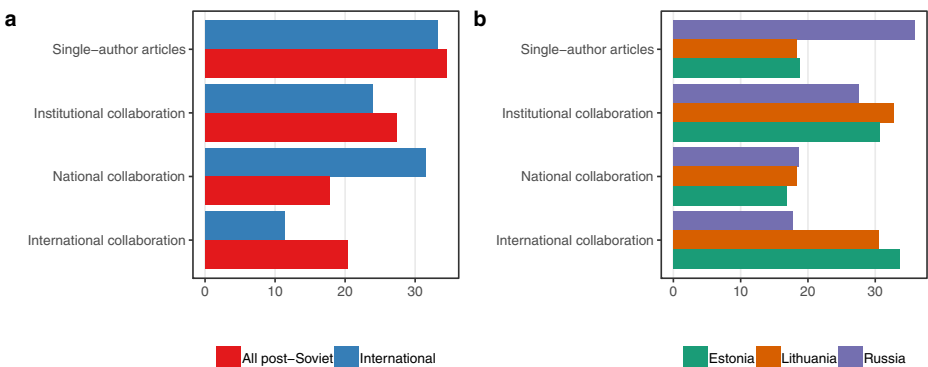


Fig. 5 Collaboration patterns among post-Soviet and international articles and (b) among Estonian, Lithuanian, and Russian articles separately (%)

Table 4 Percentage of articles with different collaboration patterns in different subsamples

All articles	Articles in English	Non-English articles	Articles in local journals	Articles in non-local journals	Articles in HE journals	Articles in Q1 journals	All articles
<i>N</i>	919	697	222	330	589	69	177
Single-author articles	34.5	30.8	45.9	39.4	31.7	24.6	26.0
Institutional collaboration	27.3	27.0	28.4	33.0	24.1	23.2	19.8
National collaboration	17.8	16.9	20.7	20.6	16.3	7.2	13.6
International collaboration	20.3	25.3	5.0	7.0	27.8	44.9	40.7

and research style, these papers require at least some degree of analysis. There were 478 such articles in our sample of post-Soviet articles (64.2% from papers with full texts available). Based on the analysis of the full texts of these articles, we determined for each of them the type of data used (quantitative or qualitative data), the level of data (micro or macro data), and the type of data analysis (descriptive or analytical) (see Table 9 in Appendix). We carried out the same codification for each article from the international sample. About three quarters (73.2%) of the empirical articles of post-Soviet authors were based on quantitative data (Fig. 6). Only 15.3% of articles were based on qualitative data, and the remaining 11.5% on both quantitative and qualitative data. In the international sample, the ratio of articles based on quantitative and qualitative data was more balanced (42.3% and 37.9% respectively), and the share of articles based on both quantitative and qualitative data almost twice as high (19.8%). By comparison with the international sample, in the post-Soviet sample a larger proportion of articles were based on macro data (33.8% vs 12.3%). However, in both samples, most articles were micro-based (62.9% and 85.2%). Again, in both samples most of the empirical articles were based solely on descriptive data analysis, and among the articles of post-Soviet authors, the share of descriptive articles was somewhat higher (79.0% vs 67.1%). Empirical articles of the three countries also differed in their characteristics (Fig. 6). According to the type and level of data on which empirical articles were based, the sample of Estonian articles was most similar to the international sample. Estonian articles exhibited the most balanced ratio of research based on quantitative and qualitative data (55.4% vs 24.1%). Among Russian empirical articles, the smallest share of research was based on the analysis of qualitative data (6.6%) and the highest share on micro data (56.8%).

Discussion

The purpose of this study was to characterize higher education research in the post-Soviet space through an analysis of publications on higher education. We also tried to understand how the features of higher education in this region, associated with the largest transformational processes, are reflected in the higher education research in the region. Based on our analysis, we can conclude that higher education is a growing area of research in the post-Soviet region. An escalating interest can be explained by the tremendous transformation in higher education systems in post-Soviet countries that has taken place in recent decades. This conclusion can be made because most of the articles are policy-oriented and are devoted to the topic of system policy. In the introduction, we mentioned that the post-Soviet countries face similar challenges

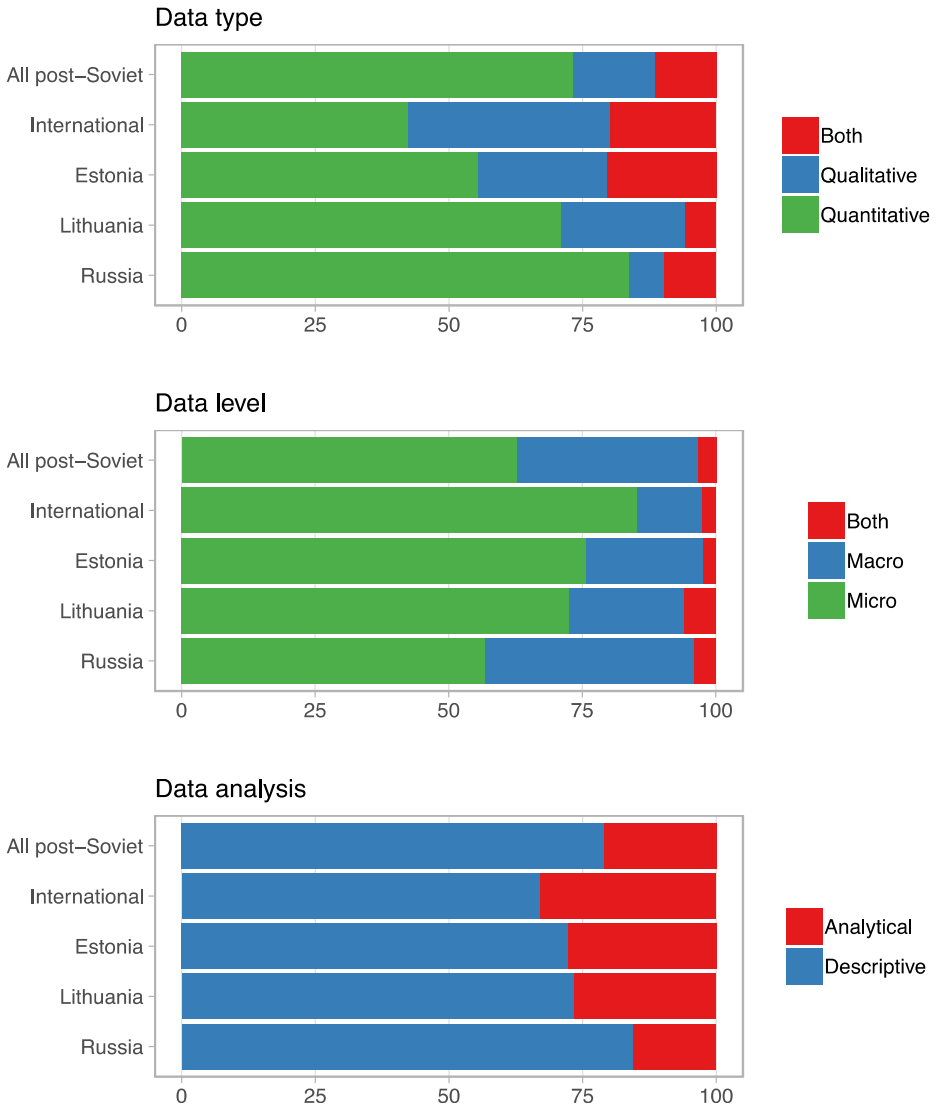


Fig. 6 Characteristics of the empirical articles among post-Soviet, international, Estonian, Lithuanian, and Russian articles separately

and reforms in higher education, including privatization, changes in admission systems, and regional transformations related to the pan-European Bologna Process (Smolentseva et al. 2018). It seems that the increase in these processes and policy questions may significantly contribute to the great popularity of system policy as a topic for articles. In these articles, authors write about reforms, transformation, higher education system, and access to higher education. However, articles on this theme cover not only these three special topics, but also many other specific issues of post-Soviet academic systems: for example, corruption, insufficient funding, the limited autonomy of higher educational institutions, a mismatch between employers' demands, and graduate supply. At the same time, typical articles on system policy usually focus on one country and often express authors' opinions rather than present the results

of rigorous analysis based on empirical data. So, the popularity of this topic and policy type of the articles may also reflect primarily the peculiarities of research culture in local communities.

The second most popular topic among post-Soviet researchers in higher education is teaching and learning and course design. This also meets our expectations since it meets the general challenges and context of the transformation processes in higher education in post-Soviet countries. As noted in the introduction, one of the components of the transformation of higher education was a change in the curriculum. The transformation of existing curricula and the creation of new ones are reflected at the level of scholarly publications. Authors write about competences, skills, educational process, quality assurance, competitiveness, preparations, and training. In terms of two general approaches to higher education research (Horta and Jung 2014; Macfarlane 2012) in the post-Soviet region, there is a balance between the teaching and learning approach and policy-based approach. The shares of these two approaches are comparable.

Our study also showed that most post-Soviet publications on higher education are not empirical studies, but are represented by publications of other types. A smaller proportion of empirical studies compared with an international comparison sample may be due to two reasons. On the one hand, system policy issues, to which a significant part of post-Soviet publications are devoted, may be more difficult to study empirically, because such studies require qualitative data that are difficult to collect. On the other hand, social sciences (higher education researchers community is to a large extent presented by researchers from social sciences) in post-Soviet countries are still inferior to “hard” sciences in terms of the level of development and training of researchers. The reason for this lies largely in the structure of Soviet science and education, shifted towards the “hard” sciences.

While we managed to find visible changes in the types of publications and their approaches, we did not find any perceptible reflections of major events or reforms which took place in the period under study. Indeed, the analysis of article keywords related to emergence of private sector of higher education, admission reforms, Bologna process, and others does not reveal any surges of attention to these topics reflected in the articles. So for the sake of space, we do not provide the detailed description of the analysis in this paper.

As predicted in the introduction, authors from post-Soviet countries are less likely to collaborate within countries, but more often collaborate internationally. This feature can be attributed to low academic mobility within countries and international assistance in the process of transformation of higher education. Overrepresentation of articles in collaboration with international colleagues among higher education journals and Q1 journals makes evident that international collaboration is, in many cases, associated with better prospects for publishing in good-quality non-local journals rather than with opportunities for comparative cross-country studies. Moreover, international collaboration turns out to be not a collaboration with authors from other post-Soviet countries but with authors from countries outside the post-Soviet region. Only 19 articles (less than 2% of the sample) were written by authors from two or more post-Soviet countries. Thus, being quite active in international collaborations, the authors did not have joint projects resulting in journal articles, either in local or in non-local journals. So, one may claim that, *de facto*, there is no unified community of post-Soviet scholars, nor common standards and approaches to higher education research. While such a space existed before the 1990s, now, one may see a strong divergence of research communities separated by national borders. Even for groups of countries among which such collaboration would not look surprising (e.g., the Baltic countries), we did not see any such collaborative output. Strictly speaking, the fact of such fragmentation allows us to refer to articles with a co-author from country X as to ones that represent exactly country X’s part of the post-Soviet region.

Despite an almost 70-year-old common history, the post-Soviet space is not homogeneous in terms of higher education research. The main contributors are only three countries (Estonia, Lithuania, and Russia). The contribution of other countries is much less. The main reason of such diversity is the different level of development of science as a whole in post-Soviet countries. In these three countries, science in general and the social sciences in particular are more developed than in the rest of the post-Soviet region. According to the Scimago Country Rank data (SCImago [n.d.](#)), Russia, Lithuania, and Estonia occupy the first three places in the overall social sciences output among the 15 post-Soviet countries. Ukraine, Latvia, and Kazakhstan occupy the fourth, fifth, and sixth positions respectively. Thus, the greatest activity of these countries in the field of higher education research is explained by the higher level of development of social sciences in these countries compared with the other post-Soviet countries. Moreover, publications from different countries in this region exhibited quite different patterns in terms of type, topics and some other important characteristics. The three leading countries have a different profile, in terms of the proportion of articles in English, articles in local journals, and articles in top journals. Estonia is different from the other two leaders having a stronger research profile. There are two potential explanations for the fact that policy-type articles represent a larger share of Russian and Lithuanian output than Estonian output. The first relates to the fact that Russian and Lithuanian articles are mostly located in local journals, while Estonian articles are more often published in non-local journals (so therefore, with high probability, international ones instead). Local journals are more open to publishing opinions, analytics, etc. in comparison with international journals, which are mostly oriented on publication of research articles. Second, higher education communities in the countries under consideration may have different structures (e.g., Estonia's includes mostly researchers, while those in Russia and Lithuania contain both researchers and policy experts), which may drive the difference in publication output structure. However, this second explanation requires further analysis, which lies beyond the scope of the current study. This diversity is consistent with the results of other studies, which also show significant differences between the post-Soviet countries in the development of scientific research (Allik [2003, 2015](#); Lauk and Allik [2018](#); Lovakov and Agadullina [2019](#)). Together with previous studies, our results demonstrate that analysis of the development of scientific research in the post-Soviet region also should include analysis of each country separately, because there is a large dispersion between them.

Our current study might to some extent have been affected by several limitations. First, we formed our sample on the basis of Scopus data, thereby excluding some local journals from our analysis. However, since we aimed to analyze those articles which at least to some extent are visible or may be visible for the international community, we do not consider that an important limitation. We are unable to say, however, what share our sample represents of the total higher education research output in the 15 post-Soviet countries. We also assumed that the literature published in local journals which are indexed in Scopus correlates highly with those published in the “non-visible” part. Second, we used number-specific keywords to form our sample, and individual articles that did not use these keywords or used other ones may not be included in our search results. Therefore, the analyzed sample could potentially have been less than the real total of all post-Soviet articles on higher education, but we saw no reason for substantial bias resulting from this. Finally, we did not identify whether different affiliations mentioned in one article belonged to different co-authors or just to one person with several affiliations. While there is a growing trend in keeping “home” affiliation in addition to a new one by people who move to another country for work or study, we believe that such cases are still relatively rare. It should also be noted that our sample includes only articles in which at least one author is affiliated with at least one post-Soviet country. However, studies of higher education in post-Soviet countries (both in Soviet and post-Soviet periods) were also

conducted and published by authors who did not have affiliation with post-Soviet countries. There are at least two reasons for this. First, Western interest in the Soviet educational system arose in the 1950s during the Cold War, when US and European researchers began to study Soviet education and publish articles about it (Chankseliani 2017). Second, as indicated in the introduction after the collapse of the USSR, many researchers left the post-Soviet countries in search of earnings and better conditions for academic activity, continuing to research post-Soviet education and publish articles, but without affiliation with post-Soviet countries. Such articles did not fall into our sample, and the conclusions do not take into account these articles.

Conclusion

While planning this study, we were inspired by the idea of a better understanding of higher education research in the post-Soviet region. The main lesson we learned was that there is no “region” in the sense of a community of scholars bonded by communication ties. Indeed, despite being rather active in international collaboration, post-Soviet researchers appeared not to publish joint papers with colleagues from other countries in the region. The key factor of such disunity is the disintegration of higher education systems of these countries themselves and rather little attempts to learn from each other’s experiences. Researchers are even not very active in collaborating with researchers within their own country so it is hard to talk about such communities within the countries (though some efforts are made through the conferences and associations). At the same time, little collaborative output of researchers from different post-Soviet countries means that higher education in the post-Soviet region is still understudied, and little is known (especially by the broader international audience) about the comparative dynamics of prospective higher education systems (Huisman et al. 2018). Thus, there are many open questions for potential research related to convergent and divergent trends of the systems’ evolution, as well as comparative characteristics of government policies and their impact.

Our study contributes to an understanding of higher education research as a field. Findings are consistent with the idea that the field of higher education research is not an independent discipline but is a field emerged after higher education became massive and even more integrated into society, and analysis of the higher education as a socio-economic institution became of a key importance for practitioners and policymakers (Altbach 2014; Yokoyama 2016). Together with previous studies (Kim et al. 2017; Wai Lo and Kit Ng 2015), it demonstrates that the features of the academic system and the context in which studies are conducted are reflected in the thematic structure of the studies and the characteristics of the research community.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Appendix

Table 5 Description of the topics

Topic	Description
Teaching and learning + course design	Different aspects of teaching and learning in higher education. The “how to teach” papers. The HE curriculum. Course design. The “what to teach” papers.
Student experience outcomes	Student experience in context of higher education. Outcomes, success, dropouts. Students’ personality, attributes, and behavior. Well-being.
Quality	Course evaluation. Grading. National and international monitoring. Ranking.
System policy	The policy context. Admission policies. Funding policies. Corruption.
Institutional management	Management practices in higher education institutions. Organizational behavior in context of higher education. Leadership and governance. Economics of scale.
Academic work	Academic profession. Nature of academic work. Academic careers and development. Experiences of academics. Postgraduate and teacher education.
Knowledge and research	Nature of research. Nature of the university. Research policy. “Disciplinary.”
Internationalization	Internationalization of higher education. Bologna Process. Internationalization of research.
History	History of higher education. History of higher education institutions and departments. Contribution and legacy of individual academics.
Other	

Table 6 Journals with highest number of articles

Group of journals	Number of articles
General interest	167
Local	
Sotsiologicheskie issledovaniia	17
Economy of Region	11
Public Policy and Administration	11
Economic Annals-XXI	10
Engineering Economics	10
Non-local	
European Research Studies Journal	6
Scientometrics	6
Baltic Journal of Economics	5
Rupkatha Journal on Interdisciplinary Studies in Humanities	4
Educational	523
Local	
Teoriya i Praktika Fizicheskoy Kultury	125
Pedagogika	45
Integration of Education	20
Informatics in Education	3
Non-local	
Russian Education and Society	80
International Journal of Educational Management	14
Higher Education	13
Higher Education Policy	12
Turkish Online Journal of Educational Technology	9
Special non-educational	354
Local	
Gornyi Zhurnal	20
Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu	12
Bylye Gody	9
Russian Journal of General Chemistry	7
Tsvetnye Metally	6
Non-local	
Scientific and Technical Information Processing	7
Baltic Journal of Management	6
Journal of Physical Education and Sport	5
Webology	5

Table 7 Article language

Language	Number (%) of articles		
	All journals	Local journals	Non-local journals
English	738 (70.7)	161 (15.4)	577 (55.3)
Non-English	306 (29.3)	294 (28.2)	12 (1.1)
Russian	222 (21.3)	219 (21.0)	3 (0.3)
Lithuanian	62 (5.9)	59 (5.7)	3 (0.3)
Ukrainian	11 (1.1)	11 (1.1)	0
German	2 (0.2)	0	2 (0.2)
Estonian	2 (0.2)	2 (0.2)	0
French	2 (0.2)	1 (0.1)	1 (0.1)
Spanish	2 (0.2)	0	2 (0.2)
Azerbaijani	1 (0.1)	1 (0.1)	0
Polish	1 (0.1)	0	1 (0.1)
Turkish	1 (0.1)	1 (0.1)	0

Percentage calculated from whole sample of the post-Soviet articles

Table 8 Percentage of different article types among articles with different collaboration patterns

	All articles	Single-author articles	Institutional collaboration	National collaboration	International collaboration
<i>N</i>	745	242	200	127	176
Methodology of teaching	14.2	15.3	15.0	14.2	11.9
Policy	36.2	49.2	29.5	37.0	25.6
Research article	48.7	35.1	55.0	47.2	61.4
Other	0.8	0.4	0.5	1.6	1.1

Table 9 Characteristics of the empirical articles in different journals

	All articles	Articles in English		Non-English articles		Articles in local journals		Articles in non-local journals		Articles in general interest journals		Articles in educational journals		Articles in special educ. Journals		Articles in HE journals		Articles in Q1 journals	
		English	437	41	105	373	73	21	237	4	127	16	54	119					
<i>N</i>	478	437	41	105	373	73	21	237	4	127	16	54	119						
Quantitative data	73.2	72.3	82.9	81.9	70.8	84.9	76.2	66.7	75	75.6	93.8	53.7	64.7						
Qualitative data	15.3	15.6	12.2	10.5	16.6	11.0	19.0	18.6	0	12.6	6.2	35.2	21.8						
Micro-level data	62.8	62.5	65.9	60.0	63.5	43.8	61.9	71.3	100	56.7	62.5	74.1	64.7						
Macro-level data	33.7	34.1	29.3	32.4	34.0	50.7	28.6	26.2	0	39.4	37.5	24.1	32.8						
Descriptive	78.7	77.3	92.7	85.7	76.7	69.9	95.2	78.5	100	79.5	87.5	68.5	68.9						
Analytical	20.9	22.2	7.3	14.3	22.8	30.1	4.8	21.5	0	18.9	12.5	31.5	31.1						

International higher education journals for comparison

Active Learning in Higher Education
 Arts and Humanities in Higher Education
 Assessment and Evaluation in Higher Education
 Christian Higher Education
 Higher Education
 Higher Education Policy
 Higher Education Quarterly
 Higher Education Research and Development
 Innovative Higher Education
 International Journal of Sustainability in Higher Education
 International Perspectives on Higher Education Research
 Internet and Higher Education
 Journal of Higher Education Policy and Management
 Journal of Computing in Higher Education
 Journal of Continuing Higher Education
 Journal of Diversity in Higher Education
 Journal of Further and Higher Education
 Journal of Geography in Higher Education
 Journal of Higher Education
 Journal of Hispanic Higher Education
 Journal of Marketing for Higher Education
 Perspectives: Policy and Practice in Higher Education
 Quality in Higher Education
 Research in Higher Education
 Review of Higher Education
 Studies in Higher Education
 Teaching in Higher Education
 Tertiary Education and Management
 International Journal of Educational Technology in Higher Education
 Journal of Applied Research in Higher Education
 Higher Education, Skills and Work-based Learning

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