

МЕЖДУНАРОДНАЯ МОБИЛЬНОСТЬ: анализ адаптационных следствий

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Integration of Biomedical Scientists from the Former Soviet Union in North America: an inside outlook

We have examined professional integration of those biomedical scientists from the former Soviet Union who entered the United States and Canada in the 1990's with temporary visas to conduct research in academic and government research centers. We looked at the retention and promotion of the scientist in academia, transfer to other occupations, migration to other countries, and return home after landing in North America. About two thirds (68 %) of Russian speaking scientists did not change their occupation and continued their employment in academic or government institutions of the host countries. Less than 10 % of researchers left to biomedical companies or moved to Europe or Australia. Some individuals with recent medical diplomas obtained licenses and went to clinical practice (6 % of total). A small fraction, about 3 %, made teaching their primary occupation. Finally, 7 % of researchers returned home. Our study provides a historical outlook that sheds light on the fate of scientists who departed from Russia and other post-soviet countries.

Keywords: Integration, Russian Biomedical Researchers, Employment Based Mobility, United States, Postdoctoral Experience, Academic Career, Foreign-Born Faculty, Diaspora

Introduction

In the 1990's, many scientists educated and trained in the Soviet Union found opportunities to continue research abroad. Numerous experts from Russia and other countries of the Former Soviet Union (FSU) addressed this phenomenon as "Brain Drain" (Asheulova, 2010; Dezhina, 2005; Kouznetsova, 1996; Suleimanov, 2010; Ушкалов и Малаха, 2000). Some scholars who study migration of scientists include this process or similar processes in other countries in a broader context as a part of "Brain Circulation" or "Brain Exchange" (Canibano et al., 2011; Pellegrino, 2001). Various aspects of Brain Drain such as the scale of migration, its geographical distribution, driving forces and its socioeconomic impact on the post-soviet countries received substantial attention. Both negative and positive effects have been discussed (Jimenez et al., 2010; Regets, 2007). On the other hand, studies of integration of FSU scientists in the research communities of foreign countries as a logical outcome of Brain Drain seem to be rare and sketchy. Integration has been defined previously as the process of gradual inclusion of newcomers in a host society with preservation of their cultural core while developing additional adaptive facets of identity, skills, networks, etc. (Remennick, 2003a).

Why is the study of integration of scientists important? In our opinion, a better understanding of this process can be helpful in broadening competences of government officials and policy makers responsible for direction and development of the national scientific resources including human capital. Particularly, it can be helpful in establishing a productive communication and cooperation with Russian speaking scientific diaspora. Contacts with scientists abroad have always been seen as a potential advantage by strategically thinking researchers and administrators. Since early 1990's exchange with foreign-based colleagues underwent a substantial transformation. A report about the conference "Scientific Diaspora and the Future of Russian Science" suggests that there is a significant interest among some representatives of the Russian scientific community in developing mutually beneficial relationships with constantly growing Russian speaking network of scientists abroad (Dezhina, 2010). We assume that knowledge about logistics and the path to success in American science can be instructive and can help to plan and forge beneficial partnerships. This study was conceived as an attempt to document the basic information about the fate of FSU scientists abroad. We were surprised by the paucity of literature on integration of scientists from Russia and other former republics of the Soviet Union in foreign countries. Israel seems to be the only exception and several studies concerning integration of Russian speaking highly qualified workers have been conducted there (Bokek-Cohen and Davidovich, 2011; Kheimets and Epstein, 2001; Remmenick, 2003a; Remmencik 2003, b).

Numerous factors affect integration (Remennick, 2003a). One of them is how immigrants secure employment in the host country. Based on this factor, A. King (2010) divided immigration into three categories: prearranged, educational and spontaneous. According to this classification, prearranged immigration comprises individuals with contract job placement obtained while being in another country. Educational immigration encompasses individuals who happen to obtain their employment after admission for education in the host country. Those individuals who gained their employment by various opportunities after arrival in the new country of residence exemplify spontaneous immigration. While this classification indeed reflects a distinctive modes of mobility which are important for subsequent integration, an argument can be raised whether it is justifiable to call any type of immigration spontaneous and not prearranged. Therefore, we prefer to use the terms employment-based,

education-based and off chance-based mobility or simply emigration instead of those advocated by King. Our study is primarily concerned with employment-based mobility of FSU scientists to North America.

It has been shown that the majority of FSU researchers, about 27%, departed in the 1990's across the Atlantic Ocean to the United States of America (Gokhberg and Nekipelova, 2002). About 2% of FSU scientists ended up taking a job in Canada. Typically, it was a postdoctoral or research associate position. A postdoctoral/research associate appointment is generally thought of as a short-term apprenticeship immediately following the defense of Ph.D. thesis. It is designed to further prepare young specialists (postdocs) for independent research in their transition to tenured faculty position with their own laboratory. A Ph. D. or Philosophy Doctor can be considered as an equivalent of Candidate of Science degree, but is the highest (Doctoral) degree in the United States. It allows its holder to seek a faculty appointment in colleges and universities known collectively as academia. Before the influx of FSU researchers in the 90's, in 1985–1986, less than a half (38 %) of American Ph. D.'s in life sciences had the chance to succeed in making their first step towards tenure, i. e. ascend from postdoctoral to tenure track faculty positions (Trends in the Early Careers of Life Scientists, 1998). In addition, there has been a 42 % increase in Ph. D.'s production between 1987 and 1996 in the USA without a parallel increase in stable employment opportunities. Therefore, FSU scientists faced a stiff competition if they wanted to continue their careers in academic research. In addition, many of them had socio-cultural challenges upon arrival in the New World such as the language barrier, adaptation to a new culture, etc (King, 2010). Taking into consideration all these difficulties, some fundamental questions about integration of FSU scientists in the United States and Canada can be formulated as follows: how many of them succeeded in becoming a part of North American research community? How many of them advanced to become leading scientists? How many of them changed their occupation, migrated to other country or returned home? Gokhberg and Nekipelova (2002) stated that there is no information about professional and social status of those Russian researchers who went abroad for a temporary work and did not return. Only a few contradictory estimates regarding returnees appeared in the press. For instance, V. Kalinushkin, the chairman of the unions represented at the Russian Academy of Sciences commented on the Russian scientists abroad: "Almost none of them have returned" (BBC, 2002). Yet according to Melkova (2001), who referred to the data provided by the Ministry of Science, about 20 % of Russian scholars came back from abroad.

The goal of this project was to explore integration of FSU scientists who arrived in the United States and Canada in the 1990's to conduct biomedical studies. We focused on the professional rather than social aspects of integration and selected a sample of those FSU scientists who gained access into North America via employment-based opportunity (not emigrants). First of all, we aimed to estimate the fraction of FSU scientists who continued their research career in academia, private research centers and hospitals (non-profit institutions) and government agencies. In addition, we traced those who switched to the commercial (for profit) research in companies or firms, and who decided to pursue careers in other occupations such as clinical medicine or teaching. Using available information about funding, we also examined the advance of FSU scientists towards establishing themselves as independent leading investigators. Finally, we estimated the proportion of those individuals who returned home and tried to elucidate factors that affected their decisions.

Subjects' selection and analysis

The size and composition of the sample

We have identified 109 FSU scientists who did not emigrate but entered the USA or Canada earlier than 2000 (mostly between 1991 and 1998) for research. Information about their career path after arrival was collected primarily by personal communications and by the use of Internet. All selected individuals received at least one degree in biomedical sciences (mostly candidate as equivalent of Ph.D. and a few M. D.) before arrival to the host country. A little less than one third of them (30 individuals) came to the sight of the first author prior to his departure to the United States. The majority (26 out of 30 individuals) was from Sechenov Institute of Evolutionary Physiology and Biochemistry of Academy of Sciences in St Petersburg, where the first author worked until the end of 1991. The rest of the scientists were met by the first author either at international conferences in the 90's (39 individuals) or during his one and a half year stay in Miami and six and a half year residency in Memphis (38 individuals) after his arrival in December of 1991. In addition, information about 2 scientists was acquired as a result of correspondence via electronic mail in the process of sharing mutual research interests. The first author of this paper is also included into analysis, which makes the total number of individuals in the sample 110. Most of them specialized in physiology, biochemistry and cell biology of the nervous/visual and circulatory systems, a smaller part — in microbiology, immunology, virology, organic chemistry, and clinical sciences. Geographical origin: Moscow or its region — 46, St. Petersburg — 39, Kiev — 6, Novosibirsk — 5, Minsk — 3, Donetsk — 2, Kazan — 2, Kishinev — 2, Odessa — 2, Erevan — 1, Irkutsk — 1, Tbilisi — 1. They found employment at various research centers across the USA (104) and Canada (6). Gender distribution: 67 males, 43 females.

Verification of occupation of the subjects

To verify that a FSU scientist still belonged to the North American academic or government research community, we collected evidence using personal communications, information obtained from websites of universities, government institutions, at conferences, or from publications dated as of 2007 or more recent for each subject. Publications served as the primary way to identify those individuals who were able to secure funding and progressed towards independent research in academia. We also identified individuals who returned home, or left academia for medical practice, for research or other activities in biomedical companies, or moved to countries other than United States and Canada.

Results

1. What % of FSU scientists who arrived in the period 1990–1999 continued as a researcher in academia, non-profit and government institutions in North America as of 2007? (75 out of 110) ~ 68.2 %

Out of 110 FSU scientists 31 (28 %) were able to secure funding for promotion to tenure positions in universities and 4 became group leaders in non-profit and governmental research institutions. Among them 24 were males and 11 were females.

2. How many % of FSU scientists went back to their homeland? (8 out of 110) ~ 7.2 %

3. What % of FSU scientists left academic research for full timework in biomedical companies? (10 out of 110) ~ 9.1 %

One individual switched to sales, not to research.

4. *What % of FSU scientists came to North America and left to conduct research in Europe or Australia? (7 out of 110) ~ 6.4 %*

3 left to Italy, 2 — to Germany, 1 — to Australia and 1 — to Spain.

5. *How many % of FSU researchers left academic research for medicine? (7 out of 110) ~ 6.4 %*

* one individual passed medical exams and was allowed to practice as a clinician, but remained mainly in academic research

6. *What % of FSU scientists left academic research for teaching? (3 out of 110) — 2.7 %*

The results are summarized in Figure 1.

Discussion

The value of our study depends on the answer to the question whether our data accurately reflect the process of integration in the whole population of FSU biomedical scientists who came to the United States and Canada in 1990's. Several authors who studied international mobility of highly skilled professionals already discussed obstacles for data acquisition and analysis (Canibano et al., 2011; Fontes, 2007; Jimenez et al., 2010; Laudel, 2003). Fontes (2007) stated that majority of empirical studies use "convenience samples" (i. e. researchers from specific organizations, scientists who were part of national or international programs, etc) due to methodological difficulties in delimitation of "population" and in measuring flows of subjects. Our study is not an exception from this general pattern. All subjects in our study fulfill the required selection criteria (i. e. arrival to conduct research with non-emigrant status in 1990–1999 and a doctoral degree) whether they were acquaintances of the first author from St Petersburg, from Memphis/Miami or attendees of international conferences met by chance. We think that high proportion of scientists from St Petersburg in our sample did not invalidate our results. Whether they came from Moscow, St Petersburg, or Kiev or any other city, they all showed potential to do quality work to be recruited for research associate/post-doctoral positions abroad. Besides, almost all of them had ties to leading academic institution in Moscow or St. Petersburg anyway. It is true, however, that some of them were better prepared and efficiently used advantages from previously established connections with renowned scientists and/or from support of those collaborators and friends who already made their way across Atlantic Ocean. Others were accepted by less prominent researchers and had little support from the network of colleagues. Nevertheless, all of them should have been able to present themselves for potential hosts through publications in English and/or via personal communications. The subjects in our study can be viewed as "convenience sample" that represent a broad spectrum of specialties and major biomedical research institutions of the former Soviet Union. Overall, we think that our approach permits certain insights to be gained about the process of integration of FSU scientists in North America.

Another question of concern for us was whether we could have expanded our sample. We are aware of publications of numerous FSU scientists in biomedical field whom we did not include in our sample. As a rule, these authors showed high productivity. Indeed, publications actually can help in identifying elite scientists (Laudel, 2003). However, they cannot be useful to trace trajectory of those scientists who did not succeed in academia or opted for other occupations in a short time after their arrival in the USA. We, however, wanted

to achieve a rather balanced reflection of all FSU researchers who came to North America. Obviously, some of them were not productive in terms of papers. Therefore, to avoid over-representation of highly productive, successful researchers in our sample we did not include those FSU scientists who could be identified by publications. In addition, through references of our colleagues we are aware of several FSU scientists who left US academia and returned home, or took teaching position, or went to work for a company. Their exclusion is justified by difficulties in verifying their career path and adherence to the selection criteria.

Are our results consistent with those reported by previous investigators? Although we were unable to find similar studies, the validity of our approach is supported indirectly by our additional observations, which are in accord with those reported previously. For example, it has been concluded that the scale of temporary engagement of Russian research scholars abroad significantly exceeded emigration of researchers (Gokhberg and Nekipelova, 2002; Ушкалов и Малаха, 2000). One then can predict that employment-based immigrants from FSU should greatly outnumber emigrants in the research community of the United States. Indeed, we did not find any Russian-speaking emigrant at a research associate position at the University of Tennessee Medical School in Memphis. By contrast, more than 20 of these positions were occupied by Russian speaking scholars admitted to the United States on temporal visa. The overwhelming predominance of Russian speaking occupants of post-doctoral positions in North America with temporary status in the 1990's is further supported by the frequency of random encounters at international meetings experienced by the first author. Only 3 emigrant attendees had been met by chance while the total number of conference encounters with non-emigrant postdocs during the same period of time was more than ten times greater. Some emigrants discussed with us their difficulties in obtaining employment in research. It has been estimated that the share of professionals who could regain their original occupations among post soviet emigrants is about 30 % in Israel and in the United States (Remmenick, 2003b). The observed pattern, therefore, confirms the statement of King (2010) that employment-based mobility provides advantages over emigration in the process of integration of scientists in a foreign country.

Our data suggest a high rate of retention of FSU scientists in academia, traditionally a major sector for employment of postdoctoral researchers. More than two thirds of them were still employed there in the second half of the first decade of the new millennium. A sector of employment where we expected to find a higher number of FSU scientists was commercial research or for-profit industry. Just above 9 % of FSU scientists who started as postdocs were found to be employed in the biomedical companies. By contrast, according to Regets (1998), about 13 % of postdocs engaged in biological research for two years in the USA left their positions for industry in 1995. The corresponding number for postdoctoral researchers in chemistry is even higher — 32 %. Further, an increase in these percentages with time logically can be expected since the majority of postdocs would not acquire faculty positions. How can the low percentage of industry employed FSU scientists in our study be interpreted? One possibility can be a lower chance for detection of industry oriented FSU scientists by our approach. Major hubs for biomedical companies are California and New England States, especially New York and Massachusetts. Perhaps, we would have a higher chance to encounter researchers employed in industry if we lived in those locations. In addition, people oriented for commercial research may not have been very active academically, i. e. may not have been inclined to present often at conferences. In fact, only once at meetings we met a half of postdocs who later went to industry. Also, we encountered 2 Russian Ph. D. holders from New York who got jobs in the local companies without postdoctoral

experience in the USA. One of them, however, switched to academia and was included in our study. These considerations support the probability that the percentage of FSU researchers who entered commercial research can be higher than 9 %. Higher salary seems to be the major factor that attracted FSU specialists to this sector. Employment at commercial firms, however, has its disadvantages. For instance, a Russian scientist complained that her work for a biotechnology firm in Texas provided no room for her creativity and intellectual freedom (Ninetto, 2000). She returned to Russia (but left research anyway). In addition, it may be generally perceived that this occupation has a high risk of unemployment. Despite our inability to keep constant track of all FSU researchers employed in industry, we have detected temporal job loss by 2 of them. These considerations about job stability and stifling of creativity may have deterred some of FSU researchers from the commercial research.

Another occupation where a higher salary undoubtedly attracted FSU specialists is clinical medicine. However, only relatively young individuals with medical degree pursued this path because it requires passing national licensing examinations in several stages, which usually takes several years. In addition, continuation of this career would require successful entrance and completion of medical residency, which adds at least three more years to the process of education. We have observed that research is a common “springboard” for a highly lucrative medical career in the USA which attracts a broad pool of international scholars, especially from India and China. All these researchers including those from the FSU contribute to a buildup of the high level of competition for medical residence positions. On the other hand, prospects of employment in the medical sector of economy, in contrast to research, seem to be more certain, stable and profitable. There is a community of Russian speaking physicians in the USA and Diaspora networking organizations such as Russian American Medical Association has been formed. Overall, medical doctors were obviously a minority in the population of FSU immigrants-researchers and the modest (6 %) outflow of them to the clinical practice reflects this fact.

A small fraction of FSU scholars (6 %) left the USA or Canada to continue their research in Europe or Australia. It might be expected that they had connections in the country of their destination. For example, a couple of FSU scientists moved back to Italy. In the past, one of them received Ph. D. and both of them enjoyed their research in this country prior to their American postdoctoral experience. In the case of departure to Spain, family factors and cultural experience did play a significant role as well. Professional prospects seemed to underlie the decisions by the scholars who moved to Australia and Germany. Once at a conference, we also met an individual who left the USA for a good position in England. He was not included in our study since we were unfortunately unable to track his career. It is clear that both conditions related to the personal life and professional considerations have an impact on the decision of scientists to seek their fortune in another country. Several researchers in our sample had an opportunity to visit and work in European countries prior to their departure to the United States. Not many of them, however, did go back to Europe. Overall, the small percentage of people in this group obviously indicates that departure from North America was not a typical path. The same conclusion can be applied to the group of those researchers who took teaching as their primary task. In general, research, not teaching, is a crucial factor for promotion in an American university. Therefore, among the faculty teaching is frequently perceived as a detractor from more important activity and a burden. Nevertheless, two out of three individuals in this group became faculty in the American medical schools. The number of these appointments is very limited and one has to demonstrate impressive skills as a lecturer to be selected for this position. It appears that

an active involvement in education of students was an important ingredient for professional fulfillment of the scholars who chose this career.

Our results suggest that return mobility of those FSU researchers who arrived in 1990's in North America was lower than 10 %. Melkova (2001), who referred to the data provided by the Ministry of Science, stated that about 20 % of Russian scholars came back from abroad. There is no contradiction between these two estimates since our assessment is concerned only with the cohort of scientist who arrived in the United States and Canada. As we mentioned previously, quite a few FSU researchers went to Europe and returned home prior to their departure to the New World. We already alluded to the methodological difficulties in studying mobility of scientists. Shuttle or pendulum migration, which probably was (Ninetto, 2000) and is (Kugel, 2010) the dominating pattern of mobility of scientists in Russia, certainly complicates the assessment of outflow. In fact, some FSU scientists in our sample returned home for a brief period of time, but later again left to the USA. They explained this move by inability to perform research in the post-soviet countries. Among the 8 scientists from our sample who returned permanently to Russia, 3 left research and went into business. Five other still retain their employment in the Academy of Sciences, but their low productivity underscores difficulties in conducting investigation in Russia and suggests partial involvement in other activities unrelated to research. Factors that appear to prompt the decision to return in some cases were family matters: divorce in a short period of time after arrival to the North America, unwillingness or inability of fiancé or a significant one to leave home. In other cases, disenchantment with sciences and new opportunities in business in Russia has been communicated as the reasons to us. Casey and co-workers (2001) and Fontes (2007) provided the detailed analysis of factors that affect the decision of scientists to return which is out of the scope of our study.

Conclusion

The breakdown of the Soviet Union resulted in the cardinal changes in the societies of newly formed countries and altered perspectives for scientists. A massive wave of highly skilled professionals left the Commonwealth of Independent States in the 1990's. The United States became a major destination for researchers with temporary contracts. Our data show that the transition of scientists from the post Soviet countries in North America was successful and the bulk of them continued research in academic, non-profit and government institutions. Our results also demonstrate that migration across Atlantic Ocean was not a “river of no return” or “one way highway”. We believe that the analysis of integration of scientists, the process that can be considered as one of the most important determinants in international mobility of highly qualified human resources, deserves a close attention of sociologists and requires further studies.

References

Asheulova N. A. (2010). International mobility as a mechanism for reproducing of the scientific elite (The example of Russian science) // The Problems of Scientists and Scientific Group Activity. Papers of the XXV session of the International School of Science and Technology Sociology. St Petersburg: St Petersburg State Polytechnical University. P. 59–74.

- BBC News, Thursday 20 June, 2002. Russian brain drain tops half a million.
- Bokek-Cohen Y. and Davidovich N.* (2011). The challenge of improving teaching in a globalizing world // *Assessment and Evaluation in Higher Education*. 2011. Vol. 36, Issue 7. P. 817–830.
- Canibano C., Otamendi F. J., Solis F.* (2011). International temporary mobility of researchers: a cross-discipline study // *Scientometrics*. Vol. 89, № 2. P. 653–675.
- Casey T., Mahroum S., Ducatel K., Barre R.* (2001). The mobility of academic researchers: academic careers & recruitment in ICT and biotechnology. A joint JRC/IPTS-ESTO study.
- Дежина И.* (2010). Путь “малых дел” или краткие заметки о прошедшей конференции // Троицкий вариант. 2010. 6 июня. № 13 (57).
- Dezhina I.* (2005). Russian scientists: Where are they? Where are they going? Human resources and research policy in Russia // *Russie. Cei. Visions*. 2005. № 4. P. 1–15.
- Fontes M.* (2007). Scientific mobility policies: how Portuguese scientists envisage the return home // *Science & Public Policy*. 2007. Vol. 34. № 4. P. 284–298.
- Gokhberg L. and Nekipelova E.* (2002). International migration of scientists and engineers in Russia // *International Mobility of Highly Skilled*. OECD Proceedings. 2002. P. 177–187.
- Jimenez J., Escalante J. C., Rodriguez C., Ramirez J. M., Morales-Arroyo M. A.* (2010). Mobility or Brain Drain? The case of Mexican scientists // *Sociology of Science and Technology*. 2010. Vol. 1. № 1. P. 89–108.
- King A.* (2010). The international mobility of scientists: sociological approach (An example of the United States of America) // *Sociology of Science and Technology*. 2010. Vol. 1. № 2. P. 97–106.
- Kheimets N. G. and Epstein A. D.* (2001). English as a central component of success in the professional and social integration of scientists from the Former Soviet Union in Israel // *Language in Society*. 2001. Vol. 30. Issue 2. P. 187–215.
- Kouznetsova T.* (1996). Brain drain: problem of contract migration in Russia // *International scientific migrations today: new perspectives* / ed. by J. Charum, J.-B. Meyer. Paris: IRD. 7 p.
- Kugel S. A.* (2010). Editorial // *Sociology of Science and Technology*. 2010. Vol. 1. № 1. P. 9–11.
- Laudel G.* (2003). Studying the brain drain: can bibliometric methods help? // *Scientometrics*. Vol. 57. P. 215–237–298.
- Melkova V.* (2001). Russia's brain drain // *The Russia Journal*. 344. P. 10–30.
- Ninetto A.* (2000). The natural habitat of science: shifting locations of freedom and constraint among migrant Russian scientists // *Anthropology of East Europe Review*. Vol. 18. № 2. P. 37–41.
- Pellegrino A.* (2001). Trends in Latin American Skilled Migration: “Brain Drain or Brain Exchange”? // *International Migration*. Vol. 39. P. 111–132.
- Regets M. C.* (2007). Research issues in the international migration of highly skilled workers. A prospective with Data from the United States // Working paper SRS07-203. Arlington, VA: Division of Science Resources Statistics, National Science Foundation.
- Regets M. C.* (1998). What follows the postdoctorate experience? Employment patterns of 1993 postdocs in 1995. Directorate for Social, Behavioral and Economic Sciences NSF 99-307 November 27. URL: nsf.gov/statistics/issuebrf/sib99307.htm
- Remennick L.* (2003a). What does integration mean? Social insertion of Russian immigrants in Israel // *Journal of International Migration and Integration*. Vol. 4. P. 23–49.
- Remennick L.* (2003b). Career continuity among immigrant professionals: Russian engineers in Israel // *Journal of Ethnic & Migration Studies*. Vol. 29. P. 701–721.
- Suleimanov A. D.* (2010). Sociological analysis of the intellectual migration in Azerbaijan // *Sociology of Science and Technology*. Vol. 1. № 1. P. 109–117.
- Trends in the Early Careers of Life Scientists. Committee on Dimensions, Causes, and Implications of Recent Trends in the Careers of Life Scientists, National Research Council. 1998 Free executive summary. URL: www.nap.edu/html/trends/
- Ушкалов И. Г., Малаха И. А.* (2000). «Утечка умов» как глобальный феномен и его особенности в России // *Социологические исследования*. 2000. № 3. С. 110–117.

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Internationalization: Cultural Adjustment of Foreign Students in the Estonian Higher Educational Context

There are a growing number of research articles pointing out the challenges university systems face that are connected with the increasing internationalization of education. Estonia, for example, is pressed for several reasons (including its demographics) to plan an effective response to the need for the internationalization of its university programs. Accompanying the need for research on managing the challenges of the internationalization of university level education is also the need for research on the particular problems students have in adjusting to the internationalization of higher education in the Estonian context. The Estonian higher educational systems, are increasingly realizing that there is a need of adjusting to internationalization. This means altering the traditional institutional identity to fit the demands of a globalized world. This article explores the challenges connected with the internationalization of higher education in Estonia however the primary concern is for facilitating internationalization in a way that enhances the learning experience for students in international programs. This article is based on a quantitative measurement of the role of culture shock in the learning performance of students studying at Tallinn University of technology. In that respect the article examines the adjustments and adaptation necessary for students studying in the Estonian cultural context.

Keywords: Cultural Adjustment, Cultural Shock (GHS), Self-Identification, Cultural Fatigability

Introduction: Understanding and Facilitating Cultural Shock

The concept university implies that the scope of the university community is itself international. This is based on the premise that reliable knowledge cannot be produced in local isolation but can only be obtained by an open and honest inquiry that is international