

DEMOGRAPHIC ECONOMIC EFFICIENCY OF HR INVESTMENT IN A RUSSIAN UNIVERSITY

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Abstract

The demographic problem of University professors aging has been a limitation for the scientific development in Russian universities. However, the global aim of higher education institutions (internationalisation and taking top positions in world university rankings) requires new strategies oriented towards a maximum efficient use of human resources. Improving language proficiency of university professors is a basis for internationalisation. The investment in language teaching and learning of different demographic groups has varying return on investment (ROI). Two indicators are used to evaluate ROI: passing international English language proficiency exams and the number of published articles per age group.

The results indicate that article publication is the highest in 40-44 age group (4.1 articles per person), and the lowest in 50-59 age group (0.45 articles on average). The most prolific age group is 30-39 with the largest absolute number of articles published (244) and high number of participants who have successfully passed international exams (83%). The highest percentage of passing grades is in the 20-24 group (100%), the lowest percentage is in 60-64 age group (50%). These data allow forecasting the efficiency of investment in 30-39 age group as the prospective university scientific human capital in Russia.

Key words: HR investment, ROI in higher education, internationalisation

JEL Code: A 14, D 90, I 29, J 11, J 24

Introduction

In the area of Economics and Sociology of Labour, there are a number of concepts that can be ranked both vertically and horizontally. The vertical division includes the concepts that describe such formal characteristics as gender, age, level of proficiency, subject to quantitative analysis. The horizontally ranked concepts describe the same characteristics in

terms of their financial value either actual or potential and therefore are subject to qualitative analysis. They are commonly referred to as non-capital assets of an organization, or as human capital in HR management comprising professional skills, abilities, knowledge, talents, training, qualifications and intelligence that constitute its staff capacity.

This invaluable intangible asset becomes crucially important for universities in the conditions of fierce competition with every ambitious university gearing towards internationalisation and establishing a strong presence in the global academic arena.

1 Background and methods

1.1 Research context and focus

Notwithstanding the fact that this global competition is a powerful drive for greater efficiency, Russian higher education has been facing various problems on the way to internationalisation. One limitation is demographic: the ageing of university professors (Gingras, 2008). Young faculty members do not have enough knowledge and experience to be very productive in publications; older professors cannot be as active as they used to be (Webber, 2012). It is a serious issue that translates into the idea that investing into specific age groups would generate more revenue. The majority of educational researchers are also unanimous about another major hindrance to internationalization - the inadequate English language proficiency of academic staff (Frumina & West, 2012; Kirichok, 2012; Slesarenko, 2012; Maudarbekova & Kashkinbayeva, 2014; Bardi, 2015).

Another view many researchers subscribe to is that wise investment in human capital aimed at improving the faculty competence has a synergistic effect on the university performance (Sung et al., 2014). Eventually, it is the employers who reap almost all the returns to staff training (Bartel, 2000).

To help catalyse the internationalisation process, Ural Federal University (UrFU) has been making substantial investment in a large-scale in-house English-language training and certification project (Okhotnikova et al., 2015; Rasskazova & Muzafarova, 2015). This includes not only the direct financing of the English-language courses for the staff and methodological training for language teachers, but also financial rewards for passing international language exams and obtaining a certificate, as well as considerable bonuses paid for authoring and publishing articles indexed in Scopus and WoS. UrFU is hoping to recoup its investment through increasing its academics' international publishing productivity which will consolidate its competitive position in the global academic market.

1.2 Research question and methods

The central query in conducting this research was to explore faculty members' responsiveness to investment depending on their age and gender. The following broad **research question** guided the data collection: which demographic group of academic staff, if invested in, is most likely to demonstrate the quickest return on investment (ROI)?

The first essential step was to identify accurate measures of the ROI rate, since this is what guides human capital investment decisions (Bartel, 2000). The indicators used to track the university's progress towards internationalization mentioned in the UrFU Road map that correlate with the project aims are as follows: percentage of academics with a sufficient command of English (75%); number of articles indexed in Web of Science and Scopus per one University professor (3.4).

Therefore, to evaluate the return on investment in language teaching and learning of different demographic groups **two indicators** were used: the number of passing grades in international English language proficiency exams and the number of Scopus and WoS-indexed articles published in 2014-2015. Quantitative **research methods**, including methods of descriptive statistics were used to identify the relationship between the indicators.

1.3 General UrFU faculty demographics

UrFU is one of ten federal universities in Russia and the largest higher education establishment in the Ural region. It currently employs 2859 academics (as of January 1, 2016) whose distribution across age and gender groups is presented in Table 1.

Tab. 1: Total number of UrFU faculty members (January 1, 2016)

| Age range | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65+ | Total | % |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-----|
| Male | 32 | 146 | 167 | 143 | 109 | 91 | 109 | 111 | 135 | 405 | 1448 | 51 |
| Female | 40 | 150 | 173 | 183 | 166 | 110 | 135 | 138 | 129 | 187 | 1411 | 49 |
| Total | 72 | 296 | 340 | 326 | 275 | 201 | 244 | 249 | 264 | 592 | 2859 | 100 |
| % | 2.5 | 10.4 | 11.9 | 11.4 | 9.6 | 7 | 8.5 | 8.7 | 9.2 | 20.7 | 100 | |

Source: UrFU Personnel Department

1.4 Investment target group - general demographics

For the purposes of this research the minimum target proficiency level was identified as B1, which according to Common European Framework of Reference for Languages is the level at which a person becomes independent in their use of language. The study focuses on the group of faculty members with B1- C1 levels confirmed by international certificates.

Tab. 2: UrFU academics’ with certified English language proficiency (B1-C1 levels) and their breakdown by age and gender (data for 2014-2015)

| Age range | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65+ | Total |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|
| Men | 2 | 17 | 19 | 10 | 6 | 9 | 8 | 5 | 5 | 2 | 83 |
| Women | 2 | 14 | 26 | 24 | 12 | 6 | 10 | 6 | 2 | 2 | 104 |
| Total | 4 | 21 | 45 | 34 | 18 | 15 | 18 | 11 | 7 | 4 | 187 |

Source: UrFU Centre for Language Excellence RU082

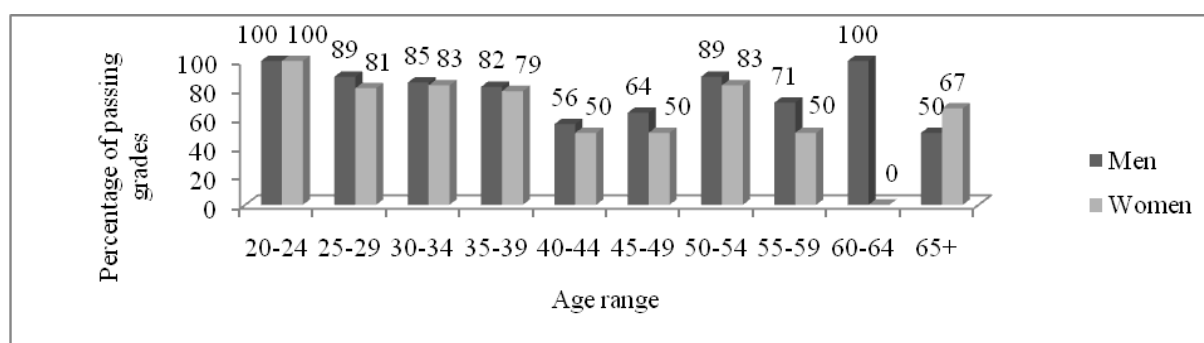
The subset comprises 187 academics, which accounts for about 7% of the total number of UrFU teachers. As the table shows, the three age groups are the largest – 25-29, 30-34, and 35-39, with the number of staff reaching 110, which constitutes 59% of the total number of project participants. As for the overall gender distribution, it goes slightly against the overall university trend – only 44% of the participants are men. However, with the increase of language proficiency level, this distribution changes – only at B1 level women are predominant (64%), at higher levels there is a slight preponderance of male academics (55%).

2 Results and discussion

2.1 Exam success rates

The first important indicator in the analysis of economic efficiency of investing in academic staff language training was the rate of success in Cambridge English exams.

Fig. 1: UrFU academics’ success rate in Cambridge English exams - breakdown by age and gender (data for 2014-2015)



Source: UrFU Centre for Language Excellence RU082

As the data suggest, the average success rate is 74%, the highest percentage of passing grades is in the youngest group (100%), the second highest is in the 50-54 age group (86%), with the subsequent two groups (30-34 and 35-39) showing almost equally high performance (84% and 82% respectively). The lowest percentages are in the 60-64 age group (50%) and

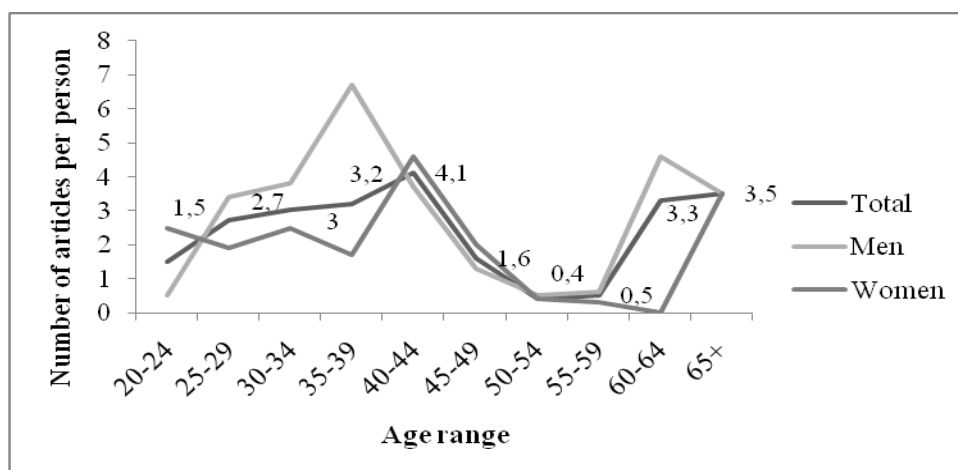
the 40-44 (52%). Overall, men perform better in exams than women – 81% on average against 69%. However, men over 65 and women in the 40-49 and 55-59 categories demonstrated only 50% performance. At the same time, women aged 60-64 showed a 0% success rate.

2.2 Publishing productivity

For further analysis numerical data on the number of publications indexed in Scopus and WoS authored by project participants in 2014-2015 were collected using the university annual reports and publication databases.

The two most prolific age groups are 30-34 and 35-39 with the absolute number of articles amounting to 244, or 51% of the total number for the chosen subset of academics (480). This indicator strongly suggests that these are the age groups worth investing in.

Fig. 2: UrFU academics' with certified English language proficiency (B1-C1 levels) publishing productivity - breakdown by age and gender (number of articles per person for 2014-2015)



Source: UrFU Annual Research Results Reports (2014-2015)

The data on the average number of publications per person shows that the most productive age group is 40-44 (4.1 articles/person). However, closer examination of gender breakdown reveals that the two most prolific groups are 35-39 year-old men (6.7) and 40-44 year-old women (4.6). Moreover, 25-29 and 30-34 year-old men are the ones who reach or exceed (3.4 and 3.8 respectively) the desired value set in the UrFU Road Map (3.4). Another productive group publication-wise is 60-64 y.o. men with 4.6 articles per person; and, surprisingly, men and women over 65 also show a fairly good rate – 3.5 articles per person. The lowest rate was observed in 50-54 and 55-59 age groups (0.4 and 0.5 respectively).

Nevertheless, taking into account their low participation rate (their proportion is only 2%) and the age-conditioned decrease in the language learning efficiency, investing in the two older groups (60-64 and 65+) does not seem to be reasonable. Above all, the reasons for their high publishing productivity are not clear and may well be connected with their overall scientific potential rather than the newly acquired language skills. However, a different investment approach may be taken – assisting them with publishing their articles through financing translation services, so that the university could tap their full research potential accumulated over their academic career. The easiest to leverage would be the four younger groups (25-44) with a potentially long academic career ahead, so that the investment could be recouped, whereas the oldest two groups' university career is on the verge of finishing.

The study of trends in publishing productivity related to gender distribution revealed that men and women reach the peak of their publishing activity at different ages – men earlier than women. The most productive age is 35-39 for men (6.7 articles/person) and 40-44 for women (4.6). For many women this is the age when their children have usually grown up and require much less of their attention and many female faculty members' priorities shift from family to academic career. With men the situation is different: at 35-39 many of them have just got married and settled down (as the general demographic trend for men is towards later marriages) and turn from active social life to career advancement associated with a higher status and a more stable financial position that they need to provide for their family.

One discernible trend that can be observed is a dramatic slump in publishing productivity in two age groups: 50-54 and 55-59 y.o. Our hypothesis is that those in their 50-s were in their late twenties and early and late thirties 20-25 years ago, the time of economic instability and crisis in the early post-Soviet Russia. Not confident about their career prospects in the academic sphere and their future financial situation, many people, especially creative and business-minded, left their low-paid jobs at university and changed their occupational sphere completely to never return to academia, which has now manifested itself in their low publishing performance. The downward trend starts in the previous age group (45-49) who were in their early twenties in the above-mentioned strained historical period when very few recent graduates saw academia as a potential employment sphere.

2.3 Indicators relationship analysis

To measure the degree of linear dependence between the exam success rate and publication productivity in different age groups (see Figures 1 and 2) the Pearson Correlation

Coefficient (PCC) was calculated. The PCC value is negative (-0.3527) which shows a weak relationship between the exam success rate and publishing productivity.

However, this should not be seen as the evidence for the investment inefficiency for several reasons. First, the project has only been run for 3 years which is too short a period for the intended outcomes to be achieved and a more longitudinal correlation research is therefore needed to evaluate the overall project efficiency; the results analysed in this study are only provisional. Secondly, taking into account that correlation does not imply causation, a more in-depth study is needed to identify the intervening variables that influence the dependence between the academics' exam success rate and their publishing productivity.

Finally, there are undoubted tangible outcomes that condition optimism about the project success – those who underwent language training demonstrate a substantially higher overall publishing productivity. Their contribution to the total number of articles written by UrFU-affiliated academics is 13% (480 out of 3727 articles), which is almost twice higher than their proportion in the total number of staff (7%). Moreover, the average number of articles per person for 2014-2015 in the subset of project participants (2.6) is exactly twice higher than the average value for all UrFU faculty (1.3). Although the rate is still far from the desired publication rate of 3.4 articles per person (set to be reached by 2020), it is twice higher than the plan for 2014-2015 (1.6) which the remaining subset of the professors only just managed to hit. This substantiates the claim that financing academics' foreign language proficiency development has a positive effect on their international publishing productivity.

As to the relationship between the publishing productivity and exam success rate in different age groups, four broad categories can be distinguished: 1. groups that had lower percentage of passing grades also had lower publishing performance (45-49, 50-54, 55-59); 2. groups with higher number of passing grades showed better publishing productivity (25-29, 30-34, 35-39); 3. a group with fairly high exam success rate which does not convert into increased publishing productivity (20-24); 4. groups where lower exam success rate does not lead to the decline in publication rate and activity (40-44, 60-64, 65+).

Consequently, it would be reasonable to infer that target demographic groups for investment that would produce higher returns in the short term are groups 2 and 4. However, in group 2 investment effort should be targeted both at supporting the academics' foreign language development and rewarding them for international publishing activity, whereas with group 4 the latter seems more practical. The younger representatives of group 3 (40-44) would benefit from financial support of their language development to help them increase their exam

success rate. In the long run investing in the younger age group (20-24) with low publication rate will be likely to yield returns when they reach the age of 35-44, when there is a rise in publishing activity. Investing in this group also seems promising, as they already have the necessary language skills and only need encouragement to start publishing more actively.

Conclusion

The initial analysis of the data reflecting the effectiveness of financing in-house foreign language support allowed identifying the demographic group that university investment effort should be targeted at: the 30-39 year-olds. This subset is most likely to yield the quickest ROI through improving the indicators of the university's internationalisation, thus promoting its visibility and overall image on the international academic arena.

The findings open up a range of future research topics: in view of the study limitations, it would be useful to explore what factors apart from demographics, language training and support condition the academics' publishing productivity through surveys and interviews.

The HR investment policy adopted by UrFU proved to be efficient for leveraging the faculty's acquired English proficiency while addressing the need for internationalisation. The significant outcomes of the policy also include building UrFU human capital, the value that faculty members provide through the application of their improved competencies, which is an essential and valuable intangible asset. These effects are promising and substantiate the need to continue pursuing the adopted strategy of investing in human capital growth.

The results obtained can contribute to informing university authorities' practical decisions about choosing a prospective demographic to invest in so that human resources could be leveraged more efficiently. When channeling a university's financial resources into additional staff training and rewards for activities that correlate with the university's overall goals, careful consideration is required on the part of decision-makers as to which age and gender group to choose. UrFU experience, adapted to the particular context, may prove beneficial for tertiary education institutions searching for ways to develop their scientific human capital both in Russia and abroad.

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