# EDULEARN 15

7TH INTERNATIONAL CONFERENCE ON EDUCATION AND NEW LEARNING TECHNOLOGIES

BARCELONA (SPAIN)
6TH - 8TH OF JULY, 2015

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# COMPARATIVE ANALYSIS OF PHDS' PUBLICATION ACTIVITY IN RUSSIA AND OTHER COUNTRIES

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## Abstract

Postgraduate education in Russia is different from other countries. And the system of scientific degrees in Russia is unique. But all these systems are aimed at development of scientific researcher in some scientific area. And researchers receive scientific degree after thesis defending. And all researchers in any countries publish results of their researches in articles and conference proceedings. The aim of our study is to investigate the publication activity of postgraduates in Russia and other countries of Europe and North America. We study dynamics in publication activity before and after thesis defending.

To make analysis we used information from resources: Web of Science, ProQuest Dissertations and Theses, and eLIBRARY.RU. In Russia major publication quantity is in Russian language in Russian journals. Information on Russian journals is collected in Scientific Electronic Library (eLIBRARY.RU).

The results showed the difference in publication activity of PhD and Russian candidates of scientific degree. Russian postgraduate had 10 publications on average to the time of thesis defense. While the applicant of PhD had only 3 publications on average to the time of thesis defense.

Two out of three Russian candidates of scientific degree don't make any researches and publications after thesis defense. About 10% of Russian candidates of scientific degree proceed to make active researches and publications. They work on the second thesis to receive degree of doctor of science. In Europe and North America every fifth of PhD's, who had publications at the moment of the thesis defense, doesn't make publications after thesis defense.

Keywords: postgraduate education, publication, PhD, thesis.

## 1 INTRODUCTION

Training of a highly qualified scientific personnel is one of the most important element for developing of innovative technologies. The present level of development of industrial production and other spheres of human activity is based upon the highest achievements and successes of scientific thought. Training of scientists is conducted within the framework of Ph.D. system.

The main result of the Ph.D. training is a PhD thesis containing new knowledge in various fields of science associated with the practical application of them in their respective spheres of production, services, etc.

The debate on what kind of training shall be for the scientific degree are endless, as learning environment is changing, changing external world and the requirements for the graduates [1]. The countries of Europe aspire to the equal systems of postgraduate training [2]. Other countries are also revising its Ph.D. training system to integrate into the international the research community. [3].

One of the discussed issues of scientific training is the articles writing in the period of thesis preparation. [4]. In different countries, in different universities and for different scientific areas the requirements to the publication activity are different. In Europe, there is a definition "PhD based on publications" [5, 6]. Conducting research and scientific paper preparation – are two different competencies for Ph.D. students. [7]. Should a Ph.D. student write articles [8]? Are postgraduate students ready to create articles [4]? What kind of Ph.D. training shall be in order to prepare Ph.D. students for this? How good is the practice of publishing articles in co-author with the supervisor [7]? Such questions arise when Ph.D. programs are developed.

In Russia answers to some of these questions are found.


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## 2 METHODOLOGY

In Russia, thesis defense takes place in the Dissertation Councils. Dissertation Council includes experts in a rather narrow area of expertise. The work of the Dissertation Councils is regulated by normative acts of the Ministry of Education and Science of Russia. Every year every Dissertation Council generates an electronic report on its activities. The report contains information about each defense of the thesis conducted in the Council. The special card is filled out for each candidates of scientific degree. The card contains data including the number of publications of the candidate, the number of publications of the candidate on the subject of the dissertation and the number of publications in journals from the List of Higher Attestation Commission (HAC).

Thus, data on publication activity of Russian Ph.D. students on defended thesis was drawn from the reports of Dissertation Councils. This data is used to assess the publication activity of the candidates before thesis defense (pre-defense period).

For the study of publication activity of the Russian candidates of science in the period after thesis defending the data of the Russian Science Citation Index (RSCI) was used. This data can be received at the resource eLIBRARY.RU. RSCI is the most comprehensive source of bibliographic information on the Russian scientific periodicals. The RSCI provides information of citations from the 4500 Russian magazines. The eLIBRARY.RU collects more than 50,000 Russian and international journals, which mainly publishes papers of Russian scientists and Ph.D. students.

For each author of a scientific article the RSCI contains information on the number of publications, citations, and other bibliometric data.

To assess publication activity of Russian Ph.D. students in the period after thesis defending the sample was taken from the reports database of Dissertation Councils in 2010. For each person from the sample data was obtained on the number of his/her publications in the period from 2011 to 2014 (post-defending period) from RSCI database.

To assess publication activity of a PhD holders from Europe and North America the sample of persons was formed from the database ProQuest Dissertations and Theses. The sample included Ph.D. students who defended their dissertations in 2010-2012. For each person from the sample data on a number of publications in pre-defending period was searched on the resource Web of Science, including the year of defending and the number of publications in the post-defending period.

All this data was processed by methods of descriptive statistics.

## 3 RESULTS

### 3.1 What do the articles mean for Ph.D. students in Russia?

A fundamental element of the Russian Ph.D. study is scientific research. The purpose of research is to produce new science knowledge in a fundamental nature or in applied area. The reliability of new knowledge is verified through its examination by the scientific community. In order to bring new knowledge to the scientific community, the scientific conferences and publications in scientific journals are widely used.

Therefore, new knowledge presented in the dissertations of the Russian Ph.D. students is primary verified in the form of publications in scientific journals and conference proceedings.

Normative acts regulating the process of academic degrees conferment in Russia contain provisions specifying the minimum number of publications where the main scientific results are presented in the thesis. Thereby a PhD student should publish main results of his/her research in scientific journals before including them in a thesis.

In addition, special attention is paid to the level of scientific journals in which PhD students must publish their scientific results. It is known there are new scientific journals and new scientific conference conducted annually. But they have different statuses. The Russian scientific community had singled out those scientific journals that have a high scientific level for each of the scientific fields. If the article is accepted for publication in one of these journals, it means that it contains really new knowledge, its authenticity doesn't raise a doubt. Naturally, every article in all of these journals is peer-reviewed, and the result of review leads to the acceptance or rejection of the article. List of the titles of

these journals is called the List of HAC. Articles published in journals from the List of HAC, counted in various criteria for receiving the positions in educational or scientific institutions, for grants and others.

Starting from 2013 Russian normative acts for the scientific degree conferment claim that degree candidates must have at least 3 publications in journals from the List of HAC for scientific research in the field of art and culture, economics, social sciences and humanities; and not less than 2 publications for scientific research in other areas.

Thus, in Russia great attention is paid to the publication activity of Ph.D. students as immutable component in the conduct of research in general and of the thesis preparation in particular. It is not only endorsed by the scientific community, but also legally fixed.

## 3.2 Publication activity of Ph.D. students in the pre-defense period

Based upon data from the reports of Dissertation Councils an average number of publications of a Ph.D. student at the time of defense for the period from 2008 to 2014 was calculated (Fig. 1).

In recent years, requirements for the number of publications of Russian Ph.D. students had become stronger [9].

If you look at the dynamics of the average number of publications per Ph.D. student in Russia (Fig. 1), in 2014 the total number of publications has reached 12 per one student and the number of publications in journals from the List of HAC was equal to 4.

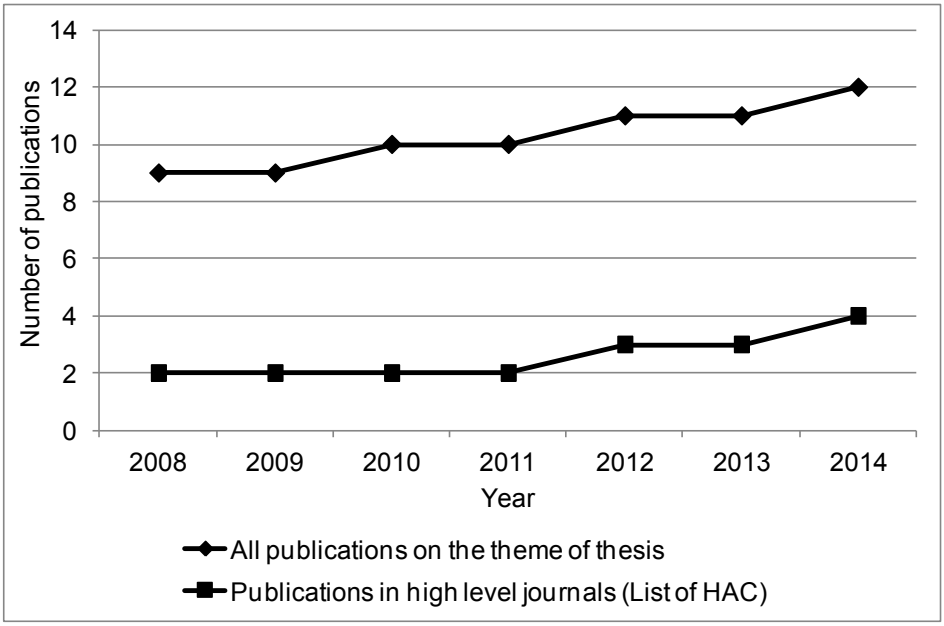


Fig. 1 – Dynamics of the average number of publications on the topic of the thesis of Russian Ph.D. student on the year of thesis defense (total and in journals from the List of HAC)

The distribution of total publications number of a Ph.D. student is presented on Fig. 2. Half of the students had made 8–15 publications. More than 10% of students had made more than 20 publications on the topic of the thesis.

In terms of the scientific fields the average number of the publications per post-graduate student in 2014 ranged from 7 to 16, which is quite a large range of differences. The authors of the largest number of publications were the Ph.D. students who perform research in the field of Geographical Sciences.

The comparison of Russian Ph.D. students with Ph.D. students from other countries was made for the fields of science: mathematics, physics, chemistry, economics, and history.

The PhD holders from Europe and North America had made to the moment of thesis defense by an average 3.4 publications registered in Web of Science (WoS). Herewith the 36% of PhD holders are not indexed in WoS, while another 15% had 0 publications at the moment of thesis defense. Thus,

about half of the PhD holders had not publications registered in WoS. If we exclude those who did not have publications in WoS, the average number of publications at the moment of thesis defense is 4.5 publications per person.

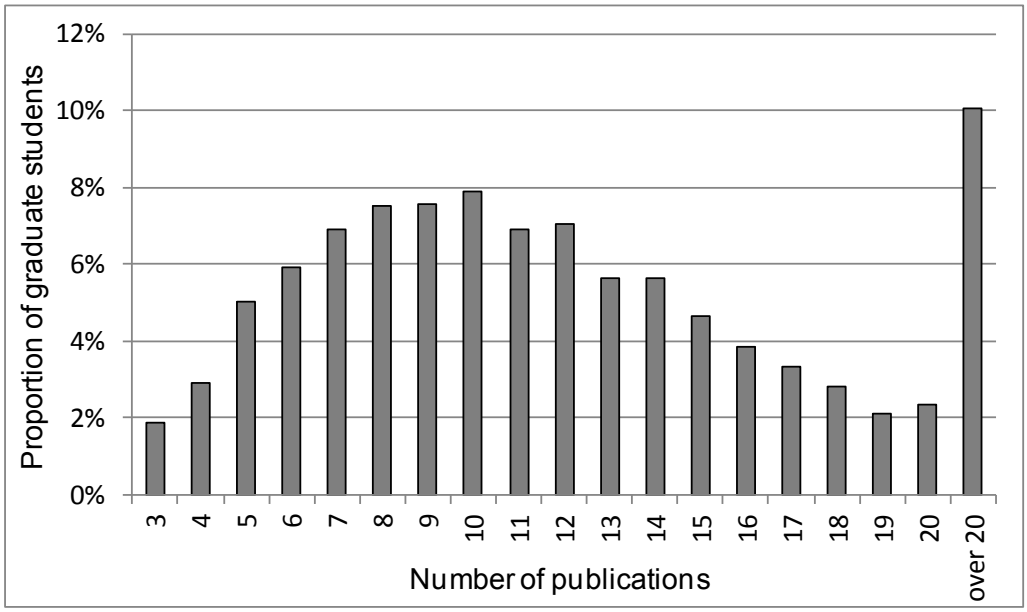


Fig. 2 – The distribution of the total number of publications on the topic of the thesis

These values are quite different for research in mathematics and natural science and research in the humanities and social sciences. Since the average number of publications per Ph.D. student at the time of thesis defense for researchers in mathematics and natural science is equal to 5.2 publications, and for social sciences and humanities – 1.7 publications.

## 3.3 Publication activity of "brand new" PhD holders after thesis defense

An important element of the research training is further involvement of the scientific degree holders into the researches. One approach to check the involvement of PhD holders in researches is to check the indicators of publication activity after the thesis defense. If the PhD holder from Russia or other countries continues its research activities, it will inevitably lead to the appearance of publications as one of the results of scientific activity.

Thus, indicators of publication activity after the thesis defense were calculated for the persons from the described samples.

For Russian candidates of science, publication activity was detected only for half of candidates. Of these, 35% had 0 publications in 2011–2014., i.e. within 5 years after thesis defense. Thus, two thirds of the candidates do not participate in researches, otherwise for 4 years after the thesis defense they would have made at least one publication indexed in the RSCI.

Of one third of remaining candidates 46% had made 1–5 publications, and about 19% – have more than 5 publications for 4 years after the thesis defense. Thus, about 10% of the candidates of scientific degree are actively engaged in scientific research, at least in terms of publication activity. The highest percentage of participating in the publication activity is observed for the scientists involved in research in the field of chemical, physical and mathematical sciences.

For PhD degree holders from Europe and North America, more than 50% do not have the publications after the thesis defense. This number includes those who did not have publications at the moment of thesis defense. Of those who had publications at the moment of the thesis defense, 23% ceased to participate in scientific activities, i.e. they have 0 publications after the thesis defense.

After thesis defense, the PhD degree holders in mathematics and natural science publish 2 publications registered in the WoS per person annually, and the PhD degrees holders in humanities and social sciences – 0.5 publications.

## 4 CONCLUSIONS

In Russia publication of scientific research in high-level scientific journals under dissertation preparation is obligatory. Publication activity is a part of the scientific community expertise of the scientific results obtained by a Ph.D. student in the corresponding scientific field.

Today all Russian Ph.D. fellows who seek to get scientific degree of a candidate of sciences and present their dissertations, have at least two publications.

After defending thesis one-third of Russian candidates of science continue their scientific activities, which are reflected in publications indexed in the RSCI. For PhD degree holders from the countries of Europe and North America about half of them continue their research, which is reflected in publications indexed in the WoS.

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