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RESEARCH MANAGEMENT AT AMERICAN UNIVERSITIES

This study is an attempt to examine the complex issue of research management using one of the oldest American universities -The College of William & Mary as a main Research Case. We consider the origin of managing research enterprise at higher education institutions, its development and current state. The U.S. models and research management culture are examined on the example of research case under consideration.

"Our students come wanting to change the world and will leave with the tools to do it."

From The William & Mary Vision Statement

1. Introduction

The close relation between higher education and research has been an axiom since Humboldt[1] first envisaged the unity of teaching and research as the focus of his new idea of a university. This idea lay behind the notion of American Research Universities. Traditional American universities were established under the auspices of both public and private benefactors to meet broad socio-economic and political objectives. This is in contrast to older European universities, which had primarily served as the breeding ground for the elite [1]. In terms of research policy, the American universities are more oriented to applied/practice based research and technology transfer while traditional European universities are oriented to basic/pure, theoretical research.

The modern research university also has this dual mission: to educate its students, and to discover new knowledge through scholarship. These two missions enhance and inform one another: students at a research university in many instances are taught by the discoverers of the information being discussed in the course, and the classroom's free exchange of ideas can help sharpen research. The quality of the research enterprise is what truly distinguishes a great university, permitting it to attract the most talented scholars and the top students.

All Armenian universities currently experience misbalance between these the two key missions of universities, teaching and researching. The teaching process (the

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[1] *Wilhelm von Humboldt was a German philosopher, government functionary and founder of Humboldt University of Berlin. He is especially remembered as a scientist who made important contributions to the theory and practice of education. In particular, he is widely recognized as having been the architect of the Prussian education system which was used as a model for education systems in countries such as the United States and Japan.*

knowledge transfer to students) is probably the most obvious and important mission universities have to fulfill. Armenian Universities have mostly been focused on improving their knowledge base (developing better teaching/learning processes and services) in order to increase and improve the knowledge transfer to students [2]. On the other hand, the research process hasn't been managed as carefully as the teaching process, since starting from Soviet times it hasn't usually been considered the core of these institutions. However leadership of every Armenian university today understands that the research process should be managed as carefully as the teaching process is managed.

2. Research management general analysis

In the US academic environment, the need for special management of research enterprise in universities emerged during World War II when university and industrial scientists were mobilized to apply their scientific and engineering expertise to the war effort. At that period two main principles were established that were essential to the expansion of research and development in American colleges and universities [3-8].

1. The federal government should become a patron of science and provide support for the advancement of knowledge.
2. Government support programs should ensure a free rein of investigation by scientists into topics and methods of their choice.

These principles guided the establishment of NSF and other Federal agencies that support research, development and education programs. Later growth in federal funding for colleges and universities created new administrative needs both in Federal structures and on campuses. Federal agencies had to establish administrative units *to plan, announce, receive, evaluate and monitor* the awards. Colleges and universities had to establish counterpart administrative offices *to develop* and *submit proposals, receive awards, monitor projects and expenditures*, and *report to sponsors*. With growth of research funding coming from both federal government and private foundations a distinctive set of pre-award functions emerged: *communicating with sponsors, identifying sources of support, encouraging and assisting faculty in the preparation of proposals, obtaining institutional approval, complying with federal regulations, and providing overall management of the grants program for the institution*. Institutions established new research administration offices to manage these functions.

Today most of higher education research management offices in US universities address a great number of unique duties which include but are not limited to [2-4]:

- identifying sources of support and communicating with sponsors,
- encouraging and assisting faculty in the preparation of proposals,
- planning, announcing , receiving, evaluating and monitoring the awards
- obtaining institutional approval,

146

- complying with federal regulations, such as animal care and human subject research,
- providing assistance in applying for patents and copyrights,
- providing overall management of the grants program for the institution.

Today's research administrator serves many "masters." Visualize a triangle with the research administrator in the middle of the triangle. The sides represent the three major sectors the administrator serves: the institution, the faculty and staff, and the sponsoring agencies. To be effective, the research administrator has to know the policies, programs, and practices of each of the three major sectors.

In recent years, the number and complexity of regulations governing grants have increased dramatically. Accordingly newer roles such as partnership building are emerging. The competitive funding scene requires increasing emphasis on diverse collaborations and partnerships. Collaborations may be *internal*, among faculty in similar disciplines or across disciplines, or *external*, with other institutions, organizations, local schools, business or industry. Joint projects with industry, sharing of research facilities, outreach to local and regional organizations, and partnerships among research universities are all part of the new mix that research administrators facilitate [6,7]. Other new roles of the research administrator move management beyond the basic functions of grant administration. Two areas, *technology transfer* and *compliance*, represent some of the multiplicity of regulation and diversity that new avenues of funding have produced, creating even more strain on research and grant office professionals.
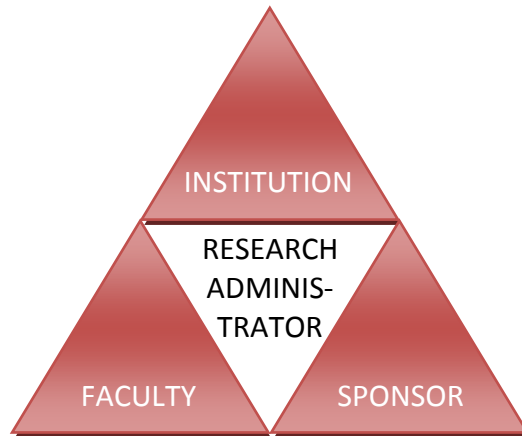
3. Case study data collection

The current case study is crafted on information gathered during meetings and interviews with administrators, faculty and staff from different U.S. universities, but the college of William & Mary William & Mary (W&M) was the *main case*. William & Mary was chartered in 1693, by King William III and Queen Mary II of England and thus is the second oldest college in America after Harvard. The College is unlike any other university in America due to its ability to stay rooted in its rich history that focuses on undergraduate student learning and at the same time it is also a cutting-edge research university. W&M is highly selective, but also public, offering a world-class education and research. Currently, W&M enrolls 6,071 undergraduates and 2,129 graduate students from all US States and 61 foreign countries [9]. They are

enrolled in five undergraduate and graduate schools: Arts & Sciences, Business, Education, Law and Marine Science. The College offers over 30 undergraduate and 10 graduate programs. There are a total of 591 full-time faculty members across all undergraduate, graduate and professional programs and the university boosts a student-faculty ratio of 12 to 1.

Most of data required for study were collected as a result of meetings and interviews with following W&M administrators and faculty

Dennis Manos	Vice Provost for Research and Graduate/Professional Studies
Stephen E. Hanson	Vice Provost for international affairs and director of the Reves Center for International Studies.
Leonard Sledge	Director, Office of Economic Development
Jason McDevitt	Director of the Technology Transfer Office
Jane Lopez	Interim Director, Office of Sponsored Programs
Cindy Corbett	Associate Director of Sponsored Programs
Gene Roche	Director of Academic Information Services
Carol Tieso	W&M Prof. One of most successful grant makers ($4M)

A lot of valuable information was also acquired at the meetings and interviews conducted during professional travel to New York and Washington, DC.

Michael Roggow	Director of Affiliated Programs, City University New York, Bronx Community College
Nancy A Busch	Chief Research Officer/Associate Vice President for Academic Affairs, Fordham University, New York
Rebecca Kennison	Director of Center for Digital Research and Scholarship (CDRS), Columbia University, New York
Robert Hilliker	Academic Commons Manager, Columbia University, New York
Kenneth Crews	Director, Copyright Advisory Office, Columbia University, New York
Bobbe Fernando	Associate Director, International Recruitment, New York University
Laura Schifter	Senior Education and Disability Advisor, US House of Representatives Education and Workforce Committee
Ilana Brunner	Legislative Director, Office of R. Scott, Member of Congress

4. Research Management in W&M

At William & Mary, the function of a truly research centered university situates research at the heart of a unique academic culture where every aspect of student, faculty, and institutional life is infused with original scholarship and hands-on inquiry. At most research universities, there is a divide separating undergraduate education from the world of graduate and faculty research projects. At W&M most of undergraduates are involved in research activities working with peers and

experienced faculty mentors on research projects of real academic value. Over the past year, faculty members have won multiple grants. In the past decade, external funding for faculty and graduate student research at W&M has doubled. That type of success has led to the creation of dozens of on- and off-campus research centers and professional collaborations [9].

W&M Physical Research Infrastructure

We used the term of physical structure to distinguish from the logical structure of research enterprise that is considered below. Hence, physically W&M supports over 20 *research centers and institutions* that can be grouped by disciplines

- Humanities and social sciences,
- Business, Education, Health Care and Law professional schools
- Natural and Computational sciences

Although the university classifies the Centers by disciplines, these are only their primary focus areas. All Centers represent a strongest interdisciplinary concentration and very often their research interests overlap. Research centers and institutes are also places for focused funding, where the latest academic research is applied to real-world innovation for the commercial, government, and non-profit sectors.

Logical Structure

Under logical structure we mean an integrated infrastructure which is not "localized" and that "penetrates" in to the physical infrastructure. W&M is a public university, governed by a *Board of Visitors*. Composed of 17 members, the Board of Visitors is appointed by the Governor of the State. Six *Senior Administrators* direct the academic and administrative activities and departments at the College. W&M is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award bachelor's, master's, post-master's certificate, doctoral and first professional degrees.

Provost

The Office of the Provost is at the core of academic administration and planning at William & Mary. The Provost is the chief academic officer for the College and oversees College's five schools - Arts & Sciences, Education, Marshall-Wythe School of Law, Mason School of Business, and Marine Science/VIMS. The Provost works closely with the President, senior management team and Board of Visitors to effectively plan and manage the College's strategic planning efforts. A priority of the Provost's responsibilities is on fostering an environment that stimulates faculty teaching and research efforts, with a focus on student achievement in the classroom and research lab. As the chief academic officer provost is reporting directly to the president and is senior among the six College administrators at the vice-presidential level. The provost, in accordance with policies established by the Board of Visitors, is responsible for all academic and research programs, academic budgets, institutional planning, space allocation, and faculty development.

Research Management Professionals and Offices

Vice Provost for Research and Graduate Professional Studies

The chief university officer in charge of research is Dennis M. Manos, *Vice Provost for Research and Graduate Professional Studies.* He is also the Director of *Applied Research Center.* Professor Dennis Manos is an eminent scholar at the College. He is also the Director of the University Consortium known as the Applied Research Center at Newport News. As vice provost for research and graduate/professional studies, Manos oversees all research and technology related issues and promote growth in both undergraduate and graduate research. Dennis Manos is a great grant-maker. During his less than 20 years of work at W&M he received and administered more than $21.5M as PI, co-PI, or Key Investigator.

Office of Grants and Research Administration

The Grants Office is the main office at W&M directly in charge of Research Management. To further the research mission of the College and help achieve a goal of the Strategic Plan "to encourage the research, scholarly and creative activities of the faculty and increase external funding for research".

The Grants Office performs four basic functions:

1. reviewing and approving proposals and awards for sponsored programs,
2. serving as the University's negotiating and executing office for sponsored program agreements and relationships,
3. interpreting the regulatory and contractual administrative requirements/ terms of these relationships
4. distributing information received concerning external funding availability to appropriate faculty.

The Grants Office provides the following main services

Pre-Award Services

- Assist faculty members to identify potential funding sources
- Disseminate information about upcoming deadlines for major grant programs to faculty
- Assist faculty members to prepare proposals and budgets based on program guidelines, policies of governmental and private sponsors, and university policies
- Review and approve on behalf of the College most proposals to outside funding agencies

Post-Award Services

- Establish and maintain grant and contract indexes
- Oversee the management of awards for compliance with sponsor's guidelines
- Approve planned expenditures to ensure costs are allowable, allocable, reasonable and consistent with funding agency regulations
- Advise principal investigators and department administrators on university, state and funding agency guidelines governing expenditures and other award activities

- Provide financial, property and patent reports to sponsors
- Provide financial reports to investigators and departments to assist in award oversight

The chart below shows the W&M award statistics dynamics for 10 years both in dollar amounts and number of projects funded [9].
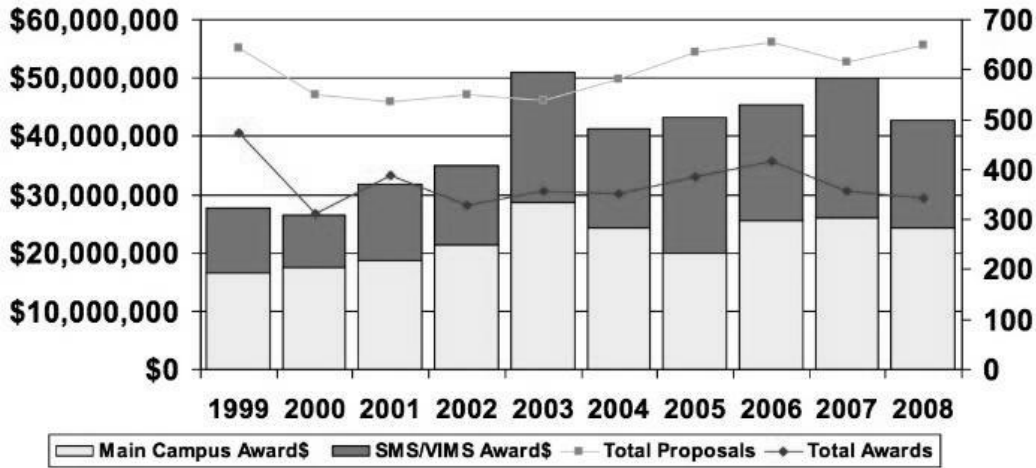
W&M award statistics. Main Campus includes the Faculty of Arts & Sciences; Schools of Business, Education and Law; Student Affairs and Aid. SMS/VIMS stands for the School of Marine Science/Virginia Institute of Marine Science.

Technology Transfer Office

The mission of the College of William and Mary Technology Transfer Office is to benefit the public by moving results of W&M research into societal use, namely:

- support effective and efficient commercialization of university technologies through appropriate mechanisms;
- support research at the College and economic development in the region;
- ensure that the process is consistent with the academic, research, and conflict of interest principles of the College.

Office of Economic Development

The Office of Economic Development is committed to support economic development by connecting faculty and students to opportunities to work with business, non-profit, academic and public partners in collaborations that strengthen College programs and contribute to new economic opportunities.

Economic development initiatives include:

- Create research and technology transfer opportunities
- Develop infrastructure and skills that support high value-added work opportunities in the Commonwealth

- Expand cultural, research and employment opportunities for students, faculty, and the community.

The W&M Research Administration is continuously working to provide the best resources and support for scholars, matching student and faculty researchers with the internal and external funding they need to excel.

5. Conclusions

The University Administration Support Program provides opportunity for participants to directly analyze US models and management culture, and to consider possible solutions to management challenges they face in our home countries. The explorative findings and analysis of Research Management in general and management of research enterprise at the College of William and Mary lead to following conclusions.

- Professional Research Management is increasingly important for successful research at the University. Research management is a multifaceted issue referring to the day-to-day activities in which the complex and permanently changing institutional environment of scientific work has to be taken into account in order to make research possible.

- My exploratory work at W&M and interviews and meeting at other US universities (Columbia University, New York, Fordham University, New York University, City University New York) shows that research management is not carried out by a single power or principal. It is instead distributed to a large number of more or less independent actors dispersed over different levels of hierarchy within the university.

- Research management is characterized by competition and collaboration of actors who have different, sometimes conflicting goals and varying access to organizational resources, power, and assets.

- The current Case Study reflects huge differences in understanding of Research Management in the USA and Armenia. Armenian universities actually didn't manage the research enterprise so far as centrally and thoroughly as the teaching/learning process, things should be changed as soon as possible.

- Research area is the most important asset for future development of Armenian Universities as on one hand research has potential to attract investments from alternative sources like the business and industry, while national government funds are miserable and hence are decreasing, and on other hand research is a way to improve the awareness and prestige of universities: it attracts students, researchers and professors.

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Գ. Հ. Դեմիրճյան
Գիտահետազոտական աշխատանքների կազմակերպումը ամերիկյան համալսարաններում

Ներկա հաղորդումը իրենից ներկայացնում է բուհական գիտահետազոտական աշխատանքների կազմակերպման ուսումնասիրման փորձ՝ դիտարկելով ամերիկյան ամենահին համալսարաններից մեկը՝ Ուիլյամ և Մերի քոլեջը՝ որպես հետազոտական օրինակ: Քննարկվում են գիտահետազոտական աշխատանքների կազմակերպման էությունը, զարգացումը և ներկա վիճակը բարձրագույն դպրոցում: Քննարկման ենթակա համալսարանի օրինակով ուսումնասիրվել են գիտահետազոտական աշխատանքների կազմակերպման ամերիկյան մոդելները:

Г. О. Демирчян
Организации научно–исследовательских работ в американских университетах

Настоящее сообщение – это попытка исследования организации научно–исследовательских работ на примере одного из старейших американских университеов – Колледжа Уильям и Мэри. Рассматривается суть организации научно–исследовательских работ, ее развитие и современное состояние. Исследуются американские модели организации научно–исследовательских работ на примере рассматриваемого университета.

Տեղեկություններ հեղինակի մասին
Դեմիրճյան Գագիկ Հովհաննեսի - ֆիզմաթ. գիտ. թեկն., դոցենտ Գյումրու պետական մանկավարժական ինստիտուտ, ֆիզիկայի, տեխնոլոգիայի և նրանց դասավանդման մեթոդիկաների ամբիոն, E-mail: dega001@yahoo.com