How to best measure performance in research?

Case at Hiroshima University

April 27, 2018

Yohsuke Yamamoto, Ph.D.
Executive Vice President for Research
Hiroshima University
Students: 15,407
UG: 10,887
Graduate: 4,520
Non-degree: 262
International: 1,443

Faculty members: 1,726

Staff members: 1,690

Campuses: 3

Budget size: 9th (among about 90 national universities in Japan)

Number of recipients of Japan’s national Grant-in-Aid for Scientific Research: 10th (among over 700 universities in Japan)

Hiroshima University (HU)
Founding Spirit: a single unified university, free and pursuing peace since the reformation in 1949

1. The pursuit of **PEACE**
2. The creation of new forms of **KNOWLEDGE**
3. The nurturing of **WELL-ROUNDED** human beings
4. **COLLABORATION** with the local, regional and international community
5. Continuous **SELF-DEVELOPMENT**
HU as a comprehensive research university

11 Schools
(Undergraduate Programs)
+ a new one in 2018

- Integrated Arts and Sciences
- Dept. of Integrated Global Studies (from 2018)
- Letters
- Education
- Law
- Economics
- Applied Biological Science
- Science
- Informatics and Data Science (from 2018)
- Engineering
- Medicine
- Dentistry
- Pharmaceutical Sciences

11 Graduate Schools
(Graduate Programs)

- Integrated Arts and Sciences
- Letters
- Education
- Social Sciences
- Law School
- Biosphere Science
- Science
- Advanced Sciences of Matter
- Engineering
- Biomedical & Health Sciences
- International Development & Cooperation
Hiroshima University (HU): a recipient of the two major national grants for universities

**RESEARCH**

Program for Promoting the Enhancement of Research Universities (for 10 years from 2013):

HU selected as one of 22 institutions

**EDUCATION**

Top Global University Project (for 10 years from 2014):

HU selected as one of 13 leading (Type A) universities

Collaborative actions to solve unpredictable global issues
Program for Promoting the Enhancement of Research Universities (FY2013-22)

◆ Funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT)

◆ To improve Japanese universities’ competitiveness, responding to globally declined share of academic papers

◆ To enhance Japanese universities’ research capabilities by implementing an intensive reform of research environment

For example, HU under this program has made efforts to:

• Develop a research propelling system such as University Research Administrators

• Facilitate continuous creation of world-class research hubs

• Establish competitive environment for securing and fostering excellent researchers

• Boost global research activities
22 Institutions selected for this Program for Promoting the Enhancement of Research Universities

- Hokkaido University
- Tohoku University
- Tsukuba University
- University of Tokyo
- Tokyo Medical and Dental University
- Tokyo Institute of Technology
- University of Electro-Communications
- Nagoya University
- Toyohashi University of Technology
- Kyoto University
- Osaka University
- Kobe University
- Okayama University
- **Hiroshima University**
- Kyushu University
- Kumamoto University
- NAIST
- Keio University (*private)
- Waseda University (*private)
- NINS
- KEK
- ROIS

$2M – 4M/year/institution

From FY 2013 through FY2022

(mid-term evaluation conducted in 2017)
Ten indicators set by MEXT related to: Program for Promoting the Enhancement of Research Universities

External funding

- National Grant-in-aid for Scientific Research
  1. Adopted numbers per researchers
  2. Adoption rates of junior researchers
  3. Grant amount per faculty members
  4. Publication in arts/humanities and social science
- Grants for creation of large-scale int’l research centers
  5. COEs, WPIs
- Grants for strategic creative research
  6. CREST, ERATO, SAKIGAKE

Production of academic papers

7. Q-values (ratio of Top 10% cited)
8. Internationally-co-authored papers (ratio of int’l co-auth’d.)

Collaborations with industry

9. Joint research with industry
10. Technology transfer (patents)
An ongoing attempt to explore how to measure performance in research

Research University Consortium
*launched with 33 research universities/institutions in Japan in 2017, including 22 ones selected by MEXT for the Program for Promoting the Enhancement of Research Universities

Taskforce to discuss improvement of research performance analysis
- Existing good practices
- Better indicators/measurement
- Arts & Humanities, and Social Science
Combined use of two Key Performance Indicators @ HU

AKPI®
Achievement-motivated Key Performance Indicator

BKPI®
Basic Effort Key Performance Indicator
Dual functions of AKPI®
Achievement-motivated Key Performance Indicator

• to monitor:
  • the level of achievement until HU becomes one of the world’s top 100 universities

• to quantify:
  • the research and educational tasks undertaken by each faculty member, for proper allocation of HU’s resources in various fields
AKPI® for HU’s monitoring faculty members’ activities with the aim of becoming a world top-100 institution

**Uses quantified measures** developed by HU

**Promotes trans-disciplinary collaborations**

**Builds int’l research network**

**Achievement-motivated Key Performance Indicator: AKPI®**

HU’s uniquely developed AKPI® (Achievement-motivated Key Performance Indicator) allows all the faculty and staff members to take backcasting approaches and monitor the concrete path to our goal, which has been set as X=1,000 (the sum of Items a. to e.) by 2023.

**SPLENDOR PLAN 2017**

*as a new long-term vision*

Thorough "university reforms" and "internationalization" to aim for a comprehensive research university as a world-class knowledge center implementing “Science for Sustainable Development”
Introduction of BKPI® since 2016
Basic Effort Key Performance Indicator

1. Education
2. Research
3. Social Services
4. University Governance
5. Medical Services
6. Center Duties

- Research papers
- Book authored
- Patent
- Presentations
- Award receiving
- Acquisition of external funds

Each faculty member engages in various responsibilities at the front lines of education, research, and social service. Hiroshima University aims to create an environment where every faculty member’s individuality and creativity are respected and well utilized, while placing the limited human resources into where this institutional objective is achieved efficiently.
Profiles of Faculty and Research Scholars

Evaluation of individual performances

AKPI / BKPI

Analysis

Dissemination to public

Tenure and promotion

Appropriate faculty assignment

Leaderships’ decision making

Integrated information on HU

~unified information management about performances in teaching and research~

Faculty Activities Management System (Data Warehouse)

Operation Systems

Data accumulated in internal offices

External funds

Education

Human resources

Outreach

Other

Automated import

Papers / Books

Research map

Web of Science CiNii, etc.
Challenges: in measuring performances in research

- Junior faculty members
- Arts & Humanities and Social Sciences
- Languages
- University rankings
Thank you!
followed by reference materials ...
Recent highlights in research

HU launching collaboration with:

- WWU Münster
- Council of Scientific & Industrial Research
- Nanyang Technological University
- Cairo University
- Arizona State University
- Future Earth

Research for global sustainability
Hiroshima University’s overseas bases
(as of April, 2018) <14 countries/regions, 16 bases>
10 Centers of Excellence and 16 Promising Research Initiatives @ HU

<table>
<thead>
<tr>
<th>V1</th>
<th>V2(1)</th>
<th>V3(13)</th>
<th>V4(8)</th>
<th>V5(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 (11)</td>
<td>Multi-disciplinary Astronomy (1)</td>
<td>Physics (2) Clinical Medicine (2) Molecular Biology / Genetics (3)</td>
<td>Material Sciences (2) Environment / Ecology Earth Science (1) Immunology</td>
<td></td>
</tr>
<tr>
<td>Q2 (9)</td>
<td>Chemistry (3) Mathematics</td>
<td></td>
<td>Agricultural Sciences (1) Botany and Zoology (2)</td>
<td>Social Sciences and General (3)</td>
</tr>
<tr>
<td>Q3 (8)</td>
<td>Biology / Biochemistry (3) Pharmacology / Toxicology</td>
<td>Computer Science Engineering (2)</td>
<td>Psychiatry / Psychology (1) Economics / Marketing (2)</td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>Microbiology Neuroscience / Behavioristics</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(No. of COEs or PRIs)

Q (Shares in the top 10% papers in terms of citation)  
V (Shares in the papers produced in each discipline in the world)
Expanding networks to accelerate international research collaborations

- Expanding the Writing Center’s functions
- Helping organize international conferences
- Improving international science communication
- Creating international research networks

Enhancing the evidence as well as reputation of research outcomes

Increasing international research collaborations and internationally co-authored papers