



## Knowledge Capital in the Philippines

### What's at Stake and the Roads to Take

#### What is Knowledge Capital?

- Approaches and outcomes that expand the boundaries of scientific inquiry
- Capacity in creating innovations and improvements in the processes of production and distribution



#### How is Knowledge Capital Created?

- Advanced Studies
- Scientific Publications
- Research and Development

#### Why is Knowledge Important?



Key to Progress



Source of Contemporary Innovation



Means that energize Industry 4.0

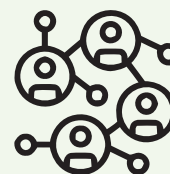
#### How does Knowledge Capital Shape the Direction of Industry 4.0?



Integrating the physical, digital, and biological worlds



Redefining required set of skills



Enhancing connectivity  
-People to People  
-Object to Object  
-People to Object

## Key Research Areas in Industry 4.0

1



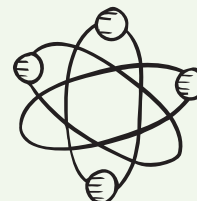
Medicine

2



Engineering

3



Materials Science

4



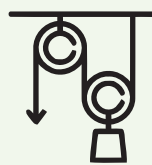
Chemistry

5



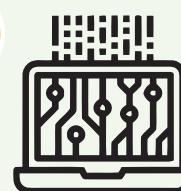
Biochemistry

6



Physics

7

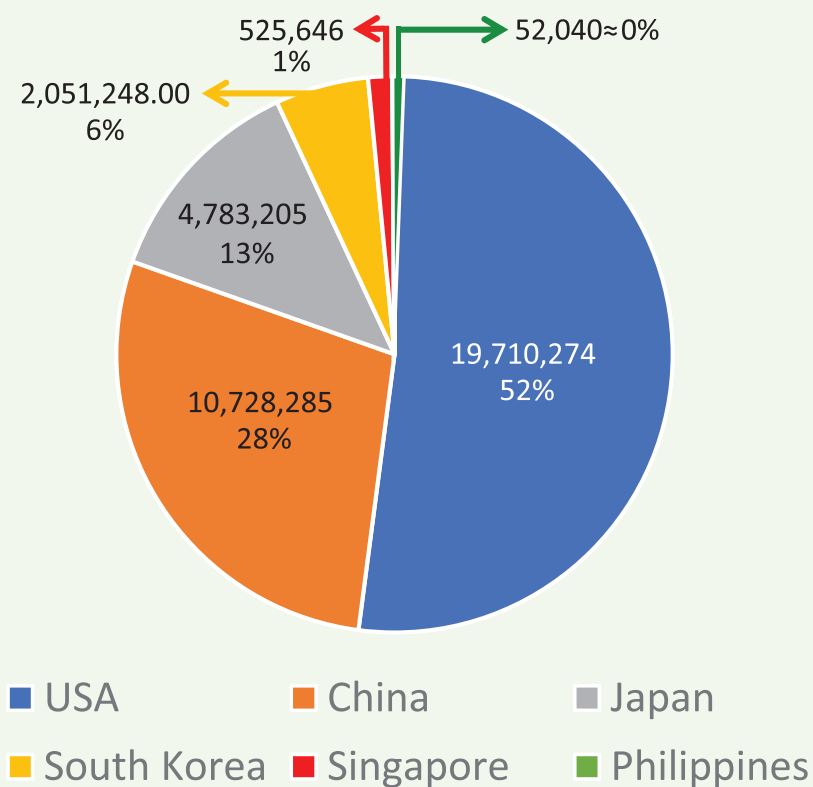


Computer Science

\*Based on publications in Scopus journals of developed economies

## Citable Documents in Scopus Journals (1996-2018)

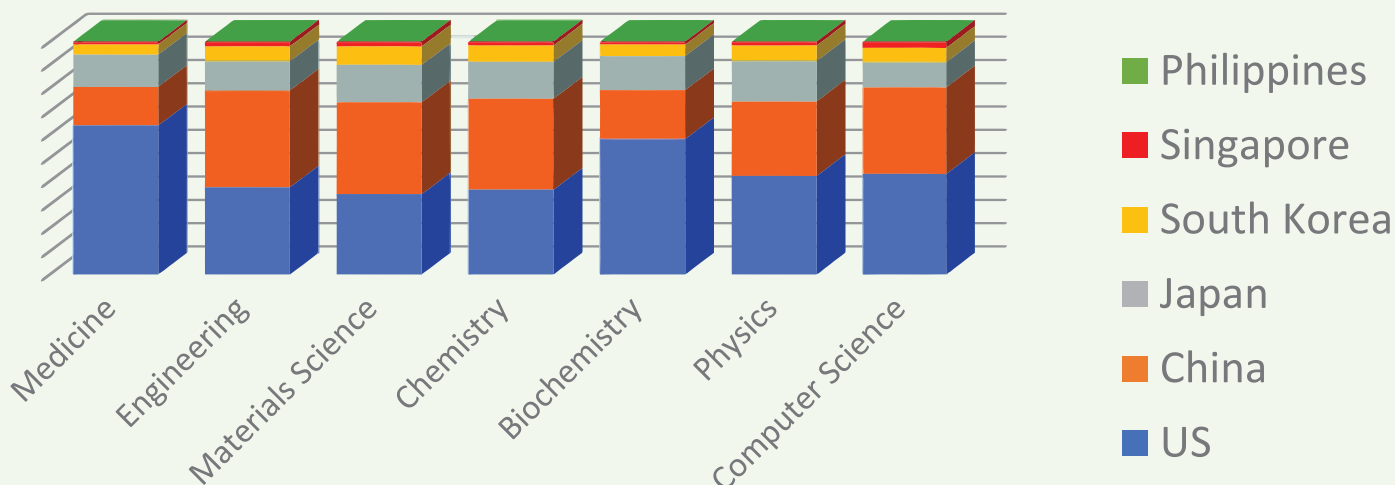
### Major Publications of the Philippines 1996 - 2018



Area of Study	Number of Publications
Medicine	8,192
Agricultural Sciences	8,082
Social Sciences	4,328
Biochemistry	3,905
Engineering	3,753
Environmental Science	3,370
Computer Science	3,075

## Share of the Philippines in Global Publications in Key Research Areas

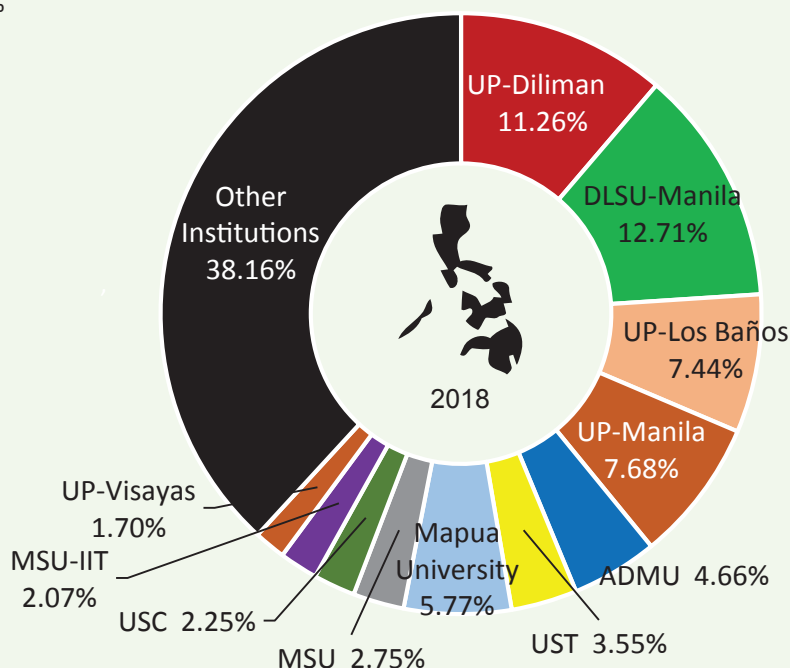
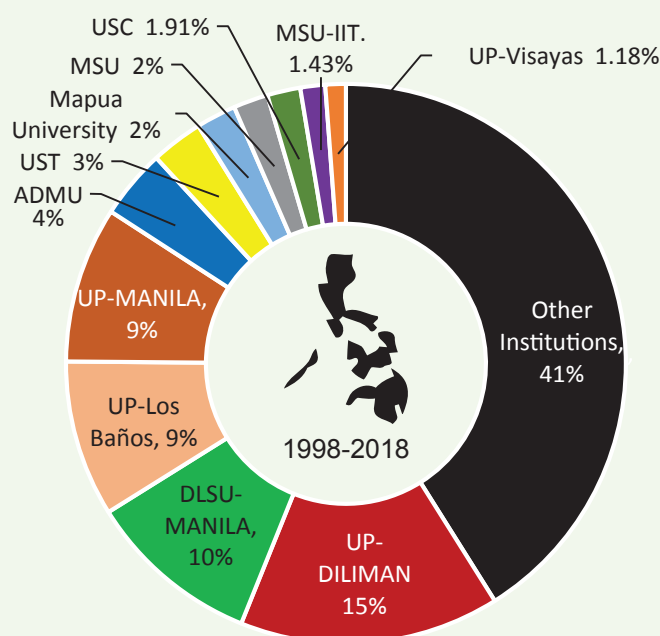
2018	0.102%	0.094%	0.068%	0.053%	0.097%	0.084%	0.183%
1996-2018	0.059%	0.041%	0.028%	0.030%	0.072%	0.036%	0.061%



### Good News!

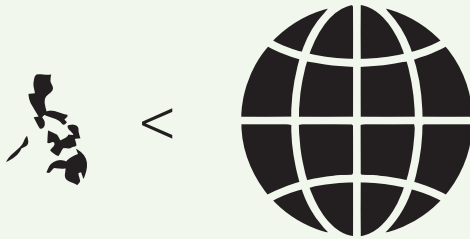
Share of the Philippines in citable documents has increased significantly by 2018.

## Leading Producers of Scientific Papers in the Philippines



## Major Directions in the Production of Scientific Papers

In the last 22 years...



Production of scientific papers in the Philippines has been insignificant compared with the leading producers in the world and the region.

But by 2018...



The marginal production in 2018 has improved substantially.



Top 4 Private Universities & the UP System are the leading producers of scientific papers in key research areas.



Production of Publications:

**5 Private Universities > 21 State Universities and Colleges (SUCs)**

92 SUCs that received research budgets from the government have no data of publication in the Scopus data base in the last 22 years

### MOVING FORWARD



Provide financial research support to key private universities



Increase public funds for the expansion of knowledge capital



Rationalize the provision of research funds for SUCs



Expand graduate education and intensify research and development activities in key areas

**CREATIVE TEAM** Tereso S. Tullao, Jr. Justin Raymond S. Eloriaga Sunyoung Won

Based on the Professorial Lecture:

"Kontribusyon ng mga Pribadong Pamantasan sa Pilipinas sa Paglikha ng Yamang-Kaalaman" (Tullao, 2019)