**Research Group Mentoring and Management**

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NAST PHIL Regional Scientific Meeting
CAP John Hay Convention Center, Baguio City
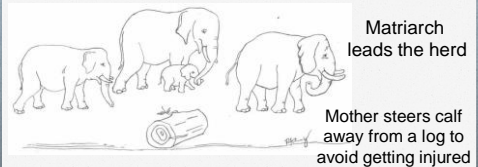May 15 - 16, 2017

Outline

- Motivation
- Objectives
- Types and modes of mentoring
- Research mentoring
  - Challenges and programs
- Research groups
  - Core values, organization, activities, conduct and etiquette
- Group formation and metrics
- Guide for Group Leaders
- Testimonials
- Summary and Conclusion

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Motivation: Elephants

From the internet

Photos of Mark Bowler

Mentoring instinct   Herding behaviour
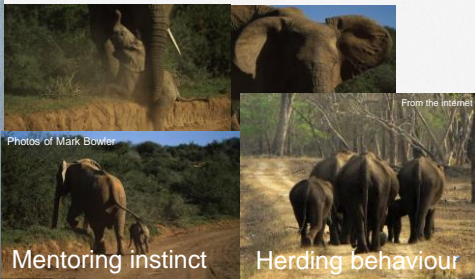
Motivation: Elephants

Analogies with a matriarchal elephant herd

Matriarch leads the herd

Mother steers calf away from a log to avoid getting injured

Female elephants **share in the supervision** of the calf

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Motivation: Research Culture

Culture – *colere* [latin, to cultivate]
- Set of beliefs, symbols, language and norms shared by a group of people, over many generations

- /dynamics/ learned through socialization and people migration enhances cultural diversity
- /types/ global, national, regional; dominant, sub-, counter-cultures; organizational culture

Research culture

- Behavioral patterns, set of values and assumptions that a group of researchers develop over the years in the process of scientific inquiry
- A healthy research culture sustains research productivity

Like culture in general, research culture is a GROUP phenomenon! 5

Motivation: R&D Management*

Executive
Mid
Operational

Long term plans, Resource generation
Monitoring, Budget preparation
Supervision, Mentoring, Production

Goals
1. Develop support systems to manage res. orgs
   ✓ Harness productivity
2. Ensure researchers to follow the law
   ✓ Promote social accountability

Critical "managing activities" are at the operational level

*Acknowledgement: Dr. Jaine Cadoc-Reyes of UPLB 6

Motivation: Publish or Perish

- Universities and research institutes are **mandated to lead in scientific research** with the **aim of creating new knowledge**
  - e.g., through publications

- Researchers are now publishing in both local and international journals, yet
  - **on the average**, number of ISI (SCI/SSCI) papers **remains low**

- Most researchers are working as teams/ co-authors
  - Teams must be further developed, get involved in establishing research programs

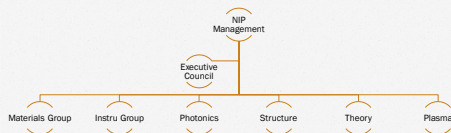One management strategy: **PROMOTE Scientific Group Mentoring**

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NIP awarded 2014 NRCP Most Outstanding Institution

o … for its contributions to the country as the leading center for physics research and education through its sound academic and research policies geared for excellence, sustained and increasing generation of new knowledge with its high-impact research **as evident in its publications and citations** in international peer-reviewed journals, resolute belief that the country can build a scientific nation manifested by **its high graduation rates of MS and PhD** Physics **students.** unwavering leadership in academic and scientific societies and tireless engagement in numerous extension work and public service to strengthen science in the nation; and as an inspiration that a Philippine institution can be at par with the world.

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NIP Organization

NIP Management
Executive Council
Materials Group | Instru Group | Photonics | Structure | Theory | Plasma

…organized into groups

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Arts Research Groups

Arts Research Groups and Projects (Open University, UK)
http://www.open.ac.uk/Arts/research/resgroups.shtml

-Collaborative work takes place in a number of research groups which run seminar series, and publish research

Interdisciplinary: Literature and Music Research Group
Art History: Art in Theory Research Group
Creative Writing: Contemporary Cultures of Writing Group
English: Book History Research Group
History: War, conflict and politics in Europe Group
Philosophy: Mind, Meaning and Rationality Research Group

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Group Orientation

o **Emphases:** Group goals, group achievements, group interests in research activities over the individual

o **Possible drawback**: processes sometimes take a bit longer

o **Advantage**: chances of arriving at sound and beneficial decisions are increased

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Objectives

- Discuss the **principles of scientific mentoring** and **research groups** (as an enabling environment for scientific mentoring)

- Present some **conditions to start and manage** a research group

- Assess the impact of research groups in scientific mentoring through **testimonials**

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Mentoring*

- <u>Supporting</u> and <u>encouraging</u> mentees to **manage their own learning** so they may
  - o develop their skills
  - o improve their performance, and
  - o maximize their potential

*Eric Parsloe, The Oxford School of Coaching and Mentoring

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Types of Mentor*

- One who knows you personally and knows your work (eg, family member)
- One who knows you but does not know your work (eg, an old friend)
- One who does not know you but knows your work (eg, former competitor)
- One who does not know you and does not know your work (eg, online coach)

*Kim Kaupe, co-founder of ZinePak

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Modes of Mentoring

- One-on-one mentoring
- Peer mentoring
- Group mentoring

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One-on-one mentoring

- ☺ Depth of experience and expertise
- ☺ Dedicated mentoring

From the Internet
Singing/voice mentor

- ☹ May tend to be heirarchical

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Peer mentoring

- ☺ One has specialized knowledge, that the other lacks
- ☺ May switch roles, collaborative

From the Internet
Senior and junior resident physicians

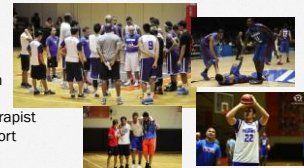- ☹ Lacks leadership and general direction

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Group mentoring

- ☺ A <u>pool</u> of members with various experiences and skills sets accessible to the mentee; a well-rounded training
- ☺ Enhances also the one-on-one and peer modes of mentoring

<u>Team sports</u>
  - o Veterans
  - o Rookies
  - o Coach
  - o Asst.Coach
  - o Manager
  - o Sports therapist
  - o Guest Import

- ☹ May need managing of egos and personalities

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Slide 1

The whole is
greater than the
sum of its parts
- Aristotle

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Slide 2

Scientific mentoring

- **What is …?**
  - o **Nurturing of young reserchers to become full-fledged scientists**
    - ✓ With a common GOAL and shared commitment to advance knowledge
- **Why perform…?**
  - o **The duty and responsibility of training future scientists rest on the shoulders of the experienced researchers**
    - ✓ Sharing of knowledge and techniques
- **How to achieve…?**
  - o **Collaboration: Mentor and mentee solve problems together**
    - ✓ NOT a hierarchical mentoring

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Slide 3

Qualities of an <u>Ideal</u> Scientific Mentor

- Serves as a good role model
- Matches interests of mentee with a research topic
- Offers fresh perspectives
- Critical yet positive in outlook
- Looks out for research opportunities, publishable research topics

Type of mentor: Scientific Mentor becomes a person…
•who knows you professionally (research) and personally (attitude, work ethics, grit)

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Slide 4

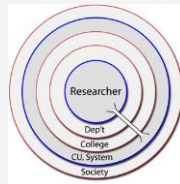### Challenges related to mentoring

- **<u>Increasing the number of competent</u>** PhD supervisors
- **<u>Attracting foreign-trained</u>** researchers
- **<u>Addressing in-breeding</u>**
- **<u>Containing the diaspora</u>** of the brightest students from local university to graduate schools abroad

*Derived from "My Expectations of the Filipino Scientist" by Dr. Caesar A. Saloma, during the awarding ceremony of the 1st Dadulfalza Achievement Award (2001).

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Slide 5

### Programs that promote scientific mentoring

- Mentoring award
- Research dissemination grant
- Int'l publication award
- Visiting professors program
- Foreign-trained PhD recruitment program


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Slide 6

At the Department level…

- Some mentoring challenges may be alleviated through the formation of **research groups**
- **Why form …?**
  - o To provide a **support group** especially for the novice researchers
  - o To attain **collaborative learning** among novice and seasoned researchers

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Slide 25 — Concept
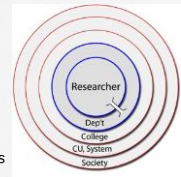
Concept

How does a research group impact mentoring?

One-on-One

One-on-One / Peer

One-on-One / Peer / Group
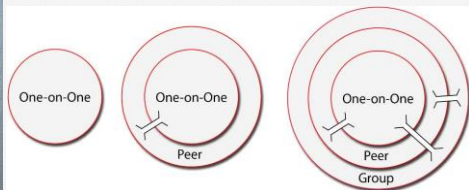
Research group **facilitates all modes** of scientific mentoring
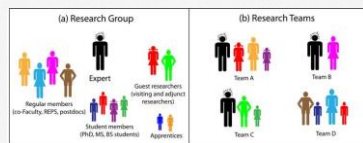
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Slide 26 — Core values of a research group

Core values of a research group

1. Contribute to scientific knowledge
2. Build a pool of experts
3. Establish collaborations (local and abroad)
4. Provide extension service to society

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Slide 27 — Organization and Activities

Organization and Activities

(a) Research Group — Expert, Guest researchers (visiting and adjunct researchers), Regular members (co-Faculty, REPS, postdocs), Student members (PhD, MS, BS students), Apprentices

(b) Research Teams — Team A, Team B, Team C, Team D

- Research Group
  - Regular seminars
  - Cooperative learning activities
  - Team building activities
- Res. Teams/ Clusters
  - Work on specific problems and topics
  - Become co-authors

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Slide 28 — Starting a research group

Starting a research group

Research interests / Dept'l thrusts / Industry, society / Funding agencies → **Program**

Human resource / Apprenticeship → **Personnel**

Support, services → **Facility**

Performance review → **Metrics**

Define goals and objectives → Secure a research project → Invite colleagues and students → Request for space → Buy equipment, supplies → Experiment and publish → Develop spin-off ideas

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Slide 29 — 3G's

What the Department/ University/ Industry and Society/ Funding Agencies want…

3G's

Research Group provides support, means and encouragement for the researcher to meet the 3G's

- **G**ive me *what* I want
  (publications, graduates/ technologies/ products, novel tools for creative work)
- **G**ive it to me *when* I want it
  (target timelines)
- *Do not* **G**ive me your *problems*
  (give me solutions, stop whining)

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Slide 30 — Apprenticeship

Apprenticeship

- Open Call, Criteria, Immersion
  - Open competition, apply (knock)
  - Grades (S&W, discipline), Interview (attitude)
  - Overview of on-going activities, rotation
- Team assignment
  - Letter of intent: order of preference; council deliberates
  - Matching of interest
  - Address the manpower needs of the Group

Apprenticeship is part of research group experience: (along with)
Transitions: Same group from BS -> MS -> PhD?
Leaving the group? Surrender log book, leave copy of thesis, papers; transition to being an alumnus

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Metrics

- Evaluation period: 3 years
  - International publications/ patents (per PhD)
  - Number of mentees graduated (PhD, MS, BS)
  - Research grants (amount)
  - Collaborations (publications and MOA)

- Continue, dissolve, merge or form new group

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Cascade mentoring

Pay it forward

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Anti-Diaspora

Research group provides good reasons for the best researchers TO STAY (OR AT LEAST A LITTLE LONGER):

High quality of the people they work with
- Attractors, pre-selection screening through apprenticeship

Shared feeling and clear concept of the significance and relevance of work
- Impact on the field and society

*Google

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Lab Conduct and Etiquette

Lab Conduct

Professional, collegial, "Take one for the team", no secrets
Confidential: within Group, within Cluster, within Team
Levels: student - student, professor - student, professor – professor, visitors, inter-lab: no borrowing

Etiquette: Social media policy: clearance from group, privacy
Social activities; Relationships

Avoiding conflicts: Clarify policies during meetings

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On Handling Conflicts or Misconduct

Remain neutral. Observe confidentiality.
Be objective in fact-finding. Keep records, be transparent.
Be final about recommendations and decisions.
In case of potential media attention or legal questions, refer to appropriate bodies.

Source: Springer/ Ethics

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Guide for Group Leaders

- Are the problems experienced in the implementation expected?
- What competencies are needed to cope with these problems?

- Am I ok to say "We did it"?
- Am I a solution to the problem (rather than the problem itself?)

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Hosting foreign researchers

Exchange visits with German Photonics Groups and NIP Photonics Group

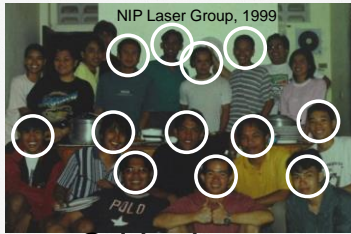Intimate sharing of ideas: No secrets! 37

Social and emotional development

NIP Photonics

It's more fun 38

Shaping careers

NIP Laser Group, 1999

Critical mass 39

Testimonials on research groups

- <u>Respondents</u>: 25 researchers
  Demographics
  - o Filipinos: 18, Foreigners: 7 (EU, US, Japan, India, China)
  - o Age: 25-35 y/o: 16 respondents, 36-60 y/o: 9 respondents

- <u>Exploratory only</u>
  - o small samples, not random, no comparison groups

- (Nonetheless) **Testimonials** reveal some insights and interesting trends

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Do you think research group is **more beneficial** than traditional one-on-one mentoring?

80   16   4
Agree Neutral Disagree
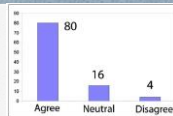
- "I strongly agree. I think research groups are imperative in order to achieve progress. The **era of "one-man" science is probably over**, at least it's becoming more and more seldom."
  - Research professor, 60 y/o (M), Denmark

- "Generally I would agree. However **one-on-one** mentoring **for brief 3 month periods** can be **exceptionally beneficial towards the end** of one's PhD program"
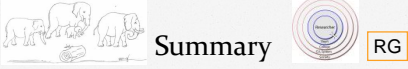 *- Research scientist, 35 y/o (M), Ireland* 41

Do you think research group formation should be **promoted in all the departments** of a **research university**?

68   16   16
Agree Neutral Disagree
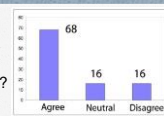
- I disagree. Different departments have **different dynamics**. However, all dept's should be **exposed** to the research group *concept* **but be able to decide if it will work for them**.
  - Research scientist, 40 y/o (F), Philippines

- I agree. Any dep't that asks for (large) investment in research must adopt the research group concept **to assure longevity and progression**.
  - Research scientist, 42 y/o (M), Philippines 42

Photo by Martin Grossnick