



# FIG WORKING WEEK 2019

22-26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



Presented at the FIG Working Week 2019,  
April 22-26, 2019 in Hanoi, Vietnam

## TS04B: Enhancing Surveying Academic Networks

# Opportunities for fostering development of academic networks in Asia and the Pacific through the FIG Asia Pacific Capacity Development Network

*Robert SARIB, David MITCHELL, and Dimo TODOROVSKI*

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Wednesday, 24 April 2019

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## Introduction

- FIG Commission 2.
- Workign Group 2.1 Developing Academic Networks.
- FIG Asia Pacific Capacity Development Network.
- Capacity building.
- Future directions for surveying education.
- Professional development through regional academic networks
- Institutional development through regional academic networks
- Global development through regional academic networks
- Conclusions

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## FIG Commission 2

- Core areas are: 1) curriculum and core surveying body of knowledge, 2) teaching and learning methodology, 3) marketing and management of professional education and 4) accreditation and quality assurance.
- For term 2019 -2022 - continue to build on the work carried out by the former commission chairs through the following focus areas:
  - **WG2.1 Developing academic networks**
  - WG2.2 Innovative teaching and learning
  - WG2.3 Evolving learning styles and needs

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## Working Group 2.1 Developing Academic Networks: Objectives

- ***share knowledge and good practices in surveying curricula and programs*** across educational institutions and across countries – especially through existing and newly created academic networks;
- ***seek feedback*** from these academic networks ***on changes in curricula and approaches*** to professional education that respond ***to the changing nature of the surveying profession***;
- ***discuss and describe core competences (knowledge, skills and attitudes)*** for the education of future land surveyors and land professionals;
- ***explore the needs of society and higher educational organizations*** to develop mechanisms and processes that will help to meet those needs;

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## Working Group 2.1 Developing Academic Networks: Objectives

- **facilitate knowledge sharing.** Promoting *sharing of advances* in professional education, research in surveying education and training and initiate joint projects (curriculum development, educational material development, joint courses, quality assurance etc.). **Improving dissemination of information** on educational theory and practice to the members across the world;
- **support capacity building for surveying higher education** in the developing world, **through strengthening knowledge transfer** (including with UN-GGIM, RICS and regional academic networks); and
- **engender cooperation with other professions.** Reinforcing cooperation with Educational Commissions of International Organisations on the related professions

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## FIG Asia Pacific Capacity Development Network

*"Responsible governance frameworks and integrated administrative systems of tenure (rights and interests) for land and marine, are underpinned by sustainable fit for purpose geodetic / geospatial infrastructure and information management"*



***WE are about building the capacities to modernise this !***

***Higher education institutions are key stakeholders!***

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## ***What is capacity development?***

**It is about understanding the challenges / obstacles that hinder an individual / organisation / community from accomplishing their objectives**

**And then developing the necessary knowledge / skills / abilities / competencies / frameworks to achieve them.**

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## ***What is capacity development?***

***It is also about .....***

***The process of learning to adapt to change....  
(or shifting the paradigms of practice)***

***Who and how and where the decisions are made***

***Being supported by a sustained resource and  
political commitment to yield longer term results***

*Source : Allan Kaplan*

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## FIG Asia Pacific Capacity Development Network

- To obtain this, surveying and geospatial professionals will need to -
  - ***Develop and enhance relevant capabilities*** to address the regional and national social, economic, environmental and technological challenges;
  - ***Resolve challenges through regional, unified, coordinated & collaborative approach;***
  - Ensure activities and initiatives have progressed ***through alliances and relationships with relevant likeminded bodies and / or development partners;*** and
  - Create a ***culture of self-reliance, and an environment of learning, innovation, comprising of a blend of mature and young professionals, and a gender equity base.***

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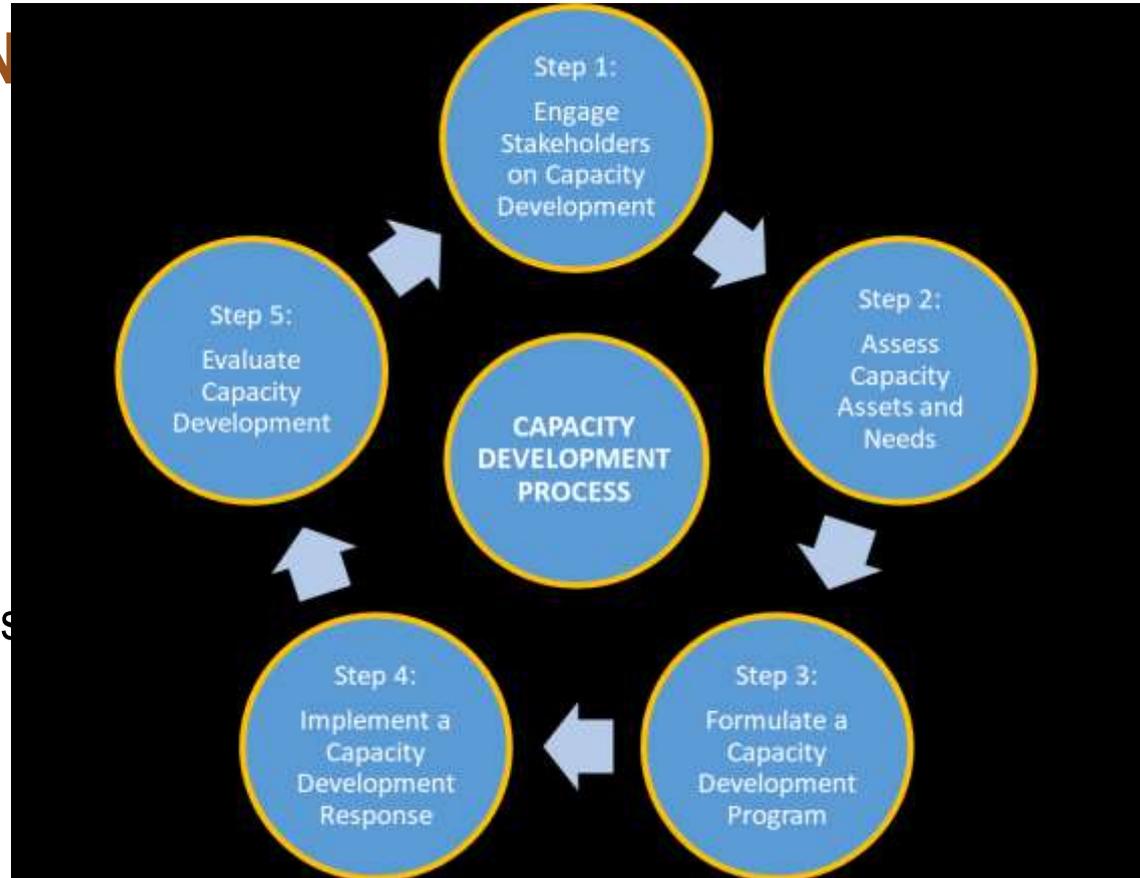
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## The future for the AP CDN

The capacity development process  
(UNDP, 2009)



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## The future for the AP CDN

- Recognize continuing **professional development is an integral** part of the geospatial and surveying culture;
- **Foster and develop** the young geospatial and surveying professionals through sponsorship and mentoring programs;
- Recognise the importance of **a diverse and inclusive** geospatial and surveying industry, and **create opportunities** to expand their involvement;
- Critically **evaluate the status of geospatial and survey capability** in academic institutions, and determine immediate needs, future core capabilities, educational and training requirements;

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## The future for the AP CDN

- **Promote and create an awareness** of the geospatial, surveying and geoscience profession to secondary school institutions through an effective technology-based marketing campaign;
- Developed mechanisms to **exchange information and experience** in key areas such as technical developments, data management and geospatial or survey techniques; and
- Engage and **form alliances with academic and relevant development partners** (both regional and local) to formulate and implement suitable and sustainable geospatial and surveying curriculum.

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## Future direction for long-standing professional education (Masum et al, 2017).

### **Internationalization and Networking**

- Increased mobility of students and teaching staff
- Study program in English language and joint study program
- Individual and institutional capacity building in developing countries
- Joint research activities
- Knowledge exchange (conferences, workshops, cooperation in national and international professional federations, e.g. FIG)
- Harmonization of curricula and education /training

### **New teaching approaches**

- From teaching to learning
- From on-site lectures to off-site lectures
- From self-contained studies to life-long-learning

### **Ways to achieve the new teaching approaches**

- Modern teaching and learning methods
- Quality Management
- Continuous Personal Development and Life Long Learning Program

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## Masum et al (2017)

- Under the heading of '**Internationalization and Networking**' they emphasised the need for:
  - Individual and institutional capacity building in developing countries;
  - Joint research activities;
  - Knowledge exchange (conferences, workshops, cooperation in national and international professional federations, e.g. FIG) ; and
  - Harmonization of curricula and education /training.

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## FIG can play a supporting role in capacity building in 3 ways:

- **Professional development** – through providing a forum for discussion and exchange of experiences and new developments.
- **Institutional development** – FIG provides support in developing basic capacity to member countries through providing guidance and guidelines.
- **Global development** – Cooperation with international NGO's such as the United Nations agencies and the World Bank allows FIG to provide a forum for global development. This cooperation provides an opportunity for joint efforts in addressing the issues facing Global South countries.

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## Professional development through regional academic networks

- **Sharing knowledge and good practices** in surveying curricula and programs across educational institutions and across countries – especially through existing and newly created academic networks;
- **Discussing and describing core competences (knowledge, skills and attitudes)** for the education of future land surveyors and land professionals;
- **Recognizing continuing professional development** is an integral part of the geospatial and surveying culture;
- **Fostering and developing the young geospatial and surveying professionals** through sponsorship and mentoring programs; and
- **Recognising the importance of a diverse and inclusive geospatial and surveying industry**, and **create opportunities** to expand their involvement.

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## Institutional development through regional academic networks

- **Seeking feedback from these academic networks** on changes in curricula and approaches to professional education that respond to the changing nature of the surveying profession;
- **Facilitating knowledge sharing.** Promoting sharing of advances in professional education, research in surveying education and training and initiate joint projects (curriculum development, educational material development, joint courses, quality assurance etc.). **Improving dissemination of information** on educational theory and practice to the members across the world;
- **Supporting capacity building for surveying higher education** in the developing world, through strengthening knowledge transfer (including with UN-GGIM, RICS and regional academic networks);

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## Institutional development through regional academic networks

- **Critically evaluating the status of geospatial and survey capability in academic institutions**, and determine immediate needs, future core capabilities, educational and training requirements;
- **Promoting and creating an awareness of the geospatial, surveying and geoscience profession to secondary school institutions** through an effective technology based marketing campaign; and
- **Developing mechanisms to exchange information and experience amongst countries**, in key areas such as technical developments, data management and geospatial or survey techniques.

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## Global development through regional academic networks

- **Exploring the needs of society and higher educational organizations** to develop mechanisms and processes that will help to meet those needs;
- **Engender cooperation with other professions.** Reinforcing cooperation with Educational Commissions of International Organisations on the related professions; and
- **Engaging and forming alliances with academic and relevant development partners** (both regional and local) to formulate and implement suitable and sustainable geospatial and surveying curriculum;

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## Conclusions

- FIG can have a supporting role in capacity development via three ways: Professional, Institutional and Global development.
- The FIG Asia Pacific Capacity Development Network, working with FIG Commission 2, and partnering with other networks in the surveying sector can make a significant contribution to the professional, institutional and global development of higher education institutions in the region.
- The benefits include improved knowledge sharing, access to information, staff development, and improved capacity.

***Higher education institutions are key stakeholders! .... MORE specifically....***

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Level	Competency Requirements	Training provided by	
1	Basic understanding of: <ul style="list-style-type: none"> <li>• GNSS</li> <li>• Reference frames, including geoid models, vertical and horizontal datums</li> </ul>	<ul style="list-style-type: none"> <li>• Educational institutions – universities and polytechnic institutes</li> <li>• Government mapping agency</li> <li>• Private companies</li> </ul>	Countries that might have one CORs and maintain a traditional geodetic network of reference marks – e.g. small Pacific Island Nations?
2	The above plus knowledge of: <ul style="list-style-type: none"> <li>• Constructing, building and running a small CORs network</li> <li>• GNSS processing using standard software - e.g. Trimble, Compass Solution (ComNav), LGO(Leica),....</li> <li>• Least squares processing and provision of datum access</li> <li>• Geoids models, precision, determinations and basic implementation</li> <li>• Implementation of a vertical datum including use of geoid models</li> </ul>	<ul style="list-style-type: none"> <li>• Educational institutions – universities and polytechs</li> <li>• UN-GGIM Geodesy Capacity Group</li> <li>• FIG</li> <li>• Government mapping agency</li> <li>• Private companies</li> </ul>	Countries with small CORs network and those who adopt global Reference frames for their nation reference frames – e.g. Fiji?
3	The above plus high knowledge of: <ul style="list-style-type: none"> <li>• Implementing and running large CORs networks</li> <li>• High end GNSS processing and datum access</li> <li>• Geoid model computation and implementation into a vertical datums</li> <li>• Monitoring earth dynamics and including in datum realization</li> <li>• Geodetic database management</li> </ul>	<ul style="list-style-type: none"> <li>• Specialized courses – e.g. geoid school</li> <li>• UN-GGIM Geodesy Capacity Group</li> <li>• IAG and FIG</li> <li>• Government mapping agency</li> <li>• Private companies</li> </ul>	Countries with a more extensive CORS and developing their own specialized national and vertical datum – e.g. New Zealand and Sweden?
4	The above plus expert knowledge of: <ul style="list-style-type: none"> <li>• Reference frame determination and computation</li> <li>• High end GNSS analysis and processing</li> <li>• SLR including analysis and processing</li> <li>• VLBI including analysis and processing</li> <li>• Gravity collection, processing and geoid determination</li> <li>• Analysis centre – combining various geodetic techniques to determine reference frame parameters</li> <li>• Use of other potential geodetic techniques – e.g. DORIS and InSAR</li> </ul>	<ul style="list-style-type: none"> <li>• IAG</li> <li>• Specialist training courses run by NASA/JPL – e.g. on VLBI or SLR</li> <li>• Private companies</li> <li>• Specialized software training courses – e.g. Bernese</li> </ul>	Countries engaged in Global Reference frame determination and Geodesy Science - e.g. US, Australia and Germany?