



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

ORGANISED BY



Wednesday, 24 April 2019

PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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;

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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!

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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.**

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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.***

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

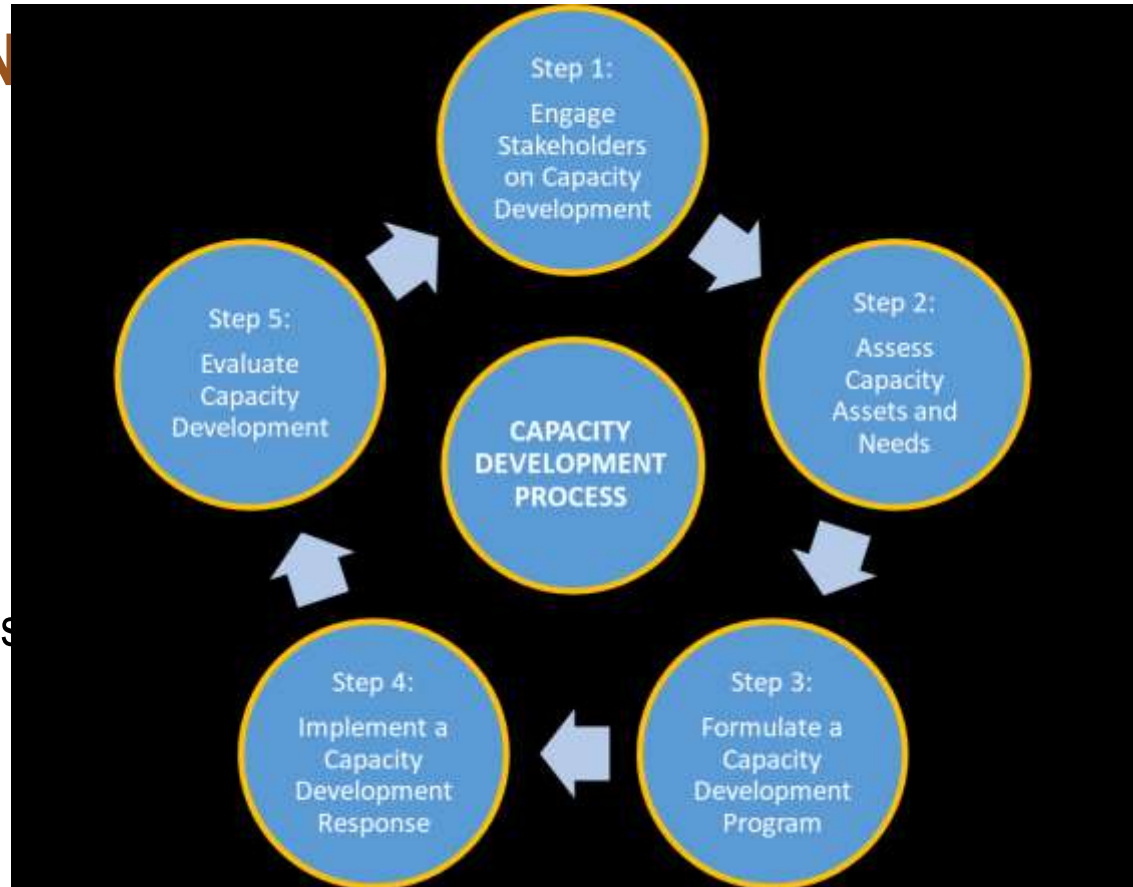
22-26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



The future for the AP CDN

The capacity development process
(UNDP, 2009)



ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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;

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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.

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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.

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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.

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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.

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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);

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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.

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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;

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"



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....

ORGANISED BY



PLATINUM SPONSORS





FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam



"Geospatial Information for a Smarter Life and Environmental Resilience"

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