Geospatial competences for lifelong learning: connecting higher education, government and geospatial industry.

Prof. Dr. Rafael de Miguel González, EUROGEO President and University of Zaragoza, Spain.

Twelfth Session of the United Nations Committee of Experts on Global Geospatial Information Management

Geospatial information for landscape monitoring and management: developing the role of higher education
• European Association of Geographers
• Legally based in Belgium
• International NGO – established 1979 by the European Commission to network geographers
• A professional association for geographers, geo- scientists and related areas
• Developed further by the HERODOT (Bologna Process) Network for higher education in Europe
• Participatory Status, Council of Europe, 1989
• Special Consultative Status at United Nations, 2017
Advance the status of geography:

• Organise events / activities for members
• Produce publications
• Support geographers
• Identify and promote good practice
• Research, give advice on geography
• Lobby at national and international levels
• Make recommendations on policies
Partnerships

• INTERNATIONAL GEOGRAPHICAL UNION
• SEAGA
• AMERICAN ASSOCIATION OF GEOGRAPHERS
• GEOTECH CENTER
• NATIONAL GEOGRAPHICAL ASSOCIATIONS
• EUROPEAN ALLIANCE SOCIAL SCIENCES AND HUMANITIES
• ESRI
• EUGEO/EUROCLIO
• EUROGI
• SUSTAINABLE DEVELOPMENTS SOLUTIONS NETWORK
• GEOCONNEXION
Amazing achievements these 43 years

- Conferences: 32
- Membership: More than 6000 individual; organisations ≈ 300
- Projects ≈ 50
- Publications: EJG, KChG
- Activities, fieldtrips, training
- Academic reputation: IGU, AAG, EASSH
- Lobbing for Geography in Europe and beyond
- Dissemination: newsletters, social media, partnerships
- Awards: Geospatial World Forum; BELMA, EC Success story

Top score: YouthMetre, MYGEO, D3

Our aim: to protect geography and to promote the work of geographers
• Participatory Status, Council of Europe, 1989
  • Democracy, Human Rights, Rule of Law
  • INGO Conference: Commission on Education and Culture
  • Committee of migrations
  • CoE Landscape Convention

• Special Consultative Status at United Nations, 2017
  • Commission on Social Development (education)
  • UN-Habitat: New urban Agenda
  • UN-GGIM
  • UNEP
• Democracy, Human Rights, Rule of Law
• INGO Conference: Commission on Education and Culture
• Migrations Committee
• CoE Landscape Convention
EUROGEO in the Policy arena (SDGs)
EUROGEO in the Policy arena (SDGs)
Geo for All - Making Geospatial education and opportunities accessible to all
A Geographical Century

Essays for the Centenary of the International Geographical Union

Abstract

International geographic education emerged at the beginning of the nineteenth century, as a consequence of the progressive implementation of modern educational systems in European countries. This process coincided with the consolidation of geography as a scientific discipline and with the creation of different national geographical societies. The foundation of the IGU in 1922 fostered the diffusion of the concept of international understanding in educational curricula, first at the various International Geographical Congresses, and later with UNESCO's initiatives for the international teaching of geography, which led to the creation of the IGU Commission on Geographical Education in 1952. Source Books for Geography Teaching (1965 and 1982), International Charters on Geographical Education (1992 and 2016), Symposia on Geographical Education, collaboration with other associations (like EUROGEO, AAG, SEAGA), international projects and publications, International Geographical Olympiads, etc., have contributed to the internationalisation of geographical education. Thus, geography educators worldwide can network, share experiences in curriculum, pedagogies and assessment, collaborate in good practices and instructional resources like geospatial technologies, or promote global understanding and a planetary citizenship seeking a sustainable development.

Keywords

Geographical education • IGU-CGE • EUROGEO • International understanding • Curriculum • Source book • International charter

10.1 Introduction

In 2022, we celebrate the centenary of the International Geographical Union (IGU). Geography, of course, a much older discipline, dating back to the time of ancient civilisations but it is consolidation as a science coincides with the establishment of the universal education systems for the entire school population implemented in European countries during the nineteenth century. Since then, geography education has been conceived from a national perspective and was codified by different national geographical societies and geographical education associations. This trend continued until the end of the first half of the twentieth century.
<table>
<thead>
<tr>
<th>Book title</th>
<th>Downloads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geospatial Challenges in the 21st Century</td>
<td>14,000</td>
</tr>
<tr>
<td>Aligning Geopolitics, Humanitarian Action and Geography in Times of Conflict</td>
<td>10,000</td>
</tr>
<tr>
<td>Geospatial Technologies in Geography Education</td>
<td>5,500</td>
</tr>
<tr>
<td>Smart Geography</td>
<td>9,000</td>
</tr>
<tr>
<td>Places of Memory and Legacies in an Age of Insecurities and Globalization</td>
<td>3,200</td>
</tr>
<tr>
<td>Frontier Making in the Amazon</td>
<td>2,000</td>
</tr>
<tr>
<td>Ocean Literacy: Understanding the Ocean</td>
<td>2,700</td>
</tr>
<tr>
<td>Hidden Geographies</td>
<td>2,400</td>
</tr>
<tr>
<td>TOTAL</td>
<td>50,000</td>
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</table>
GEOGRAPHIC INFORMATION SYSTEMS IN HIGHER EDUCATION GEOGRAPHY: A BENCHMARK STATEMENT

Graduates completing postgraduate geography study programmes specialising in GISscience, should be familiar with the following concepts at an advanced level:

- knowledge of the concepts of GI Science;
- problem-oriented knowledge and skills in GI Science;
- the handling, management and manipulation of geographic information;
- the performance of complex spatial analysis and modelling;
- the visualisation and communication of spatial information; and
- management and coordination of GISscience & GI systems projects.
COMPETENCES TO HANDLE SPATIAL INFORMATION

COMPETENCE TO REFLECT, APPRAISE AND EVALUATE

COMPETENCE TO ACTIVELY COMMUNICATE AND PARTICIPATE
- Critically read, interpret cartographic and other visualisations in different media
- Be aware of geographic information and its representation through GI and GIS.
- Visually communicate geographic information
- Describe and use examples of GI applications in daily life and in society
- Use (freely available) GI interfaces
- Carry out own (primary) data capture
- Be able to identify and evaluate (secondary) data
- Examine interrelationships
- Extract new insight from analysis
- Reflect and act with knowledge
### GI-Learner competencies

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Critically read, interpret cartographic and other visualisations in different media</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>Be able to read maps and other visualisations</td>
<td>Example: use legend, symbology ...</td>
<td></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Be able to interpret maps and other visualisations</td>
<td>Example: use scale, orientation; understand meaning, spatial pattern and context of a map</td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Be critically aware of sources of information and their reliability</td>
<td>Example: critically evaluate maps identifying attributes, representations (e.g. inappropriate use of symbology, or stereotyping) and metadata of the maps</td>
<td></td>
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<tr>
<td><strong>2</strong></td>
<td>Be aware of geographic information and its representation through GI and GIS.</td>
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<td></td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>Recognize geographical (location-based) and non-geographical information</td>
<td>Example: describe GPS, GIS, Internet interfaces; be able to identify geo-referenced information</td>
<td></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Demonstrate that geographical information can be represented in some ways</td>
<td>Example: employ some different representations of information (maps, charts, tables, satellite images...)</td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Be critically aware that geographic information can be represented in many different ways</td>
<td>Example: be able to evaluate and apply a variety of GI data representations</td>
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<tr>
<td><strong>3</strong></td>
<td>Visually communicate geographic information</td>
<td></td>
<td></td>
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<tr>
<td><strong>A</strong></td>
<td>Transmit basic geographic information</td>
<td>Example: produce a mental map, be aware of your own position</td>
<td></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Communicate with geographic information in suitable forms</td>
<td>Example: basic map production for a target audience - using old and new media, Share results with target group</td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Be able to use GI to exchange in dialogue with others</td>
<td>Example: discuss outcomes like survey results/maps online or in class, referring to a problem in own environment</td>
<td></td>
</tr>
</tbody>
</table>
EUROGEO, GEO-PROJECTS AND INNOVATION IN EDUCATION

✓ GEOGRAPHY HIGHER EDUCATION: HERODOT, MYGEO, GEOLAND...

✓ GEOGRAPHY SCHOOL EDUCATION: SPACIT, I-GUESS, DIGITAL-EARTH.EU, SCHOOL ON THE CLOUD, GI-LEARNER, GI- PEDAGOGY, D3, GEOCAPABILITIES, EVALUE, BIOMAPS, V-GLOBAL, GEODEM...

✓ GEOGRAPHY FOR EMPLOYABILITY, VOCATIONAL TRAINING, ADULT EDUCATION, NON-FORMAL EDUCATION: GEOSKILLS+, YOUTHMETRE, GO-DIGITAL, SEED...

✓ INTERNATIONAL AND EUROPEAN EDUCATION: EURO.GEO, HERODOT, GEODEM, EVALUE.

✓ DIGITAL GEOGRAPHY EDUCATION AND GEOSPATIAL EDUCATION: IGUESS, DIGITAL-EARTH.EU, I-USE, MY STORY MAP, SCHOOL ON THE CLOUD, L-CLOUD, D3, GO-DIGITAL, BIOMAPS, HUMAN, V-GLOBAL, MYGEO.

✓ SPATIAL THINKING: GI-LEARNER, GI PEDAGOGY.

✓ POWERFUL GEOGRAPHY: GEOCAPABILITIES 1, 2 & 3, EAT.

✓ SPATIAL CITIZENSHIP, EMPOWERMENT: SPACIT, YOUTHMETRE,

✓ GEOGRAPHICAL EDUCATION FOR SUSTAINABLE DEVELOPMENT: SEACHANGE, SEED, RIDE&SMILE, ONLIFE, GEOLAND, SMART VILLAGE, TEACHING THE FUTURE.

Which competence fits better for different education level/topic?

https://www.eurogeography.eu/projects/
5 E’S: GEOGRAPHICAL & GEOSPATIAL EDUCATION FOR BRIDGING EUROPEAN CITIZENS
(De Miguel, 2020)

• Enhancing personal development

• Enabling digital skills

• Empowering youth people

• Engagement, participation for democracy and European citizenship

• Employability (fostering)
7 GEOGRAPHICAL COMPETENCES

• 1. SPATIAL THINKING I. LOCATE
Orientation, location, projections, scales

• 2. SPATIAL THINKING II. PROCESS
Obtaining, processing geographical information, fieldwork, GST

• 3. SPATIAL THINKING I. REPRESENT
Spatial visualization: text, figures, statistical, cartographical

• 4. GEOGRAPHICAL THINKING AND UNDERSTANDING I. DESCRIBE
Spatial description, geographical patterns and structures in the territory

• 5. GEOGRAPHICAL THINKING AND UNDERSTANDING II. EXPLAIN

• 6. SPATIAL CITIZENSHIP I. INTERPRET (KNOW, APPLY AND REASON)
Critical thinking, global understanding, spatial imbalances, social justice

• 7. SPATIAL CITIZENSHIP I. ACT.
Intervention, engagement, youth empowerment, social participation, SDG’s
**Cognitive Domain**

<table>
<thead>
<tr>
<th>Knowing</th>
<th>Applying</th>
<th>Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Identify or describe similarities and differences between physical and human environments and their interaction.</td>
<td>Use knowledge of geographic concepts to interpret relevant visual, verbal, numerical, textual and spatial information.</td>
</tr>
<tr>
<td></td>
<td>Relate knowledge of an underlying geographic concept to physical and human environments and their interaction.</td>
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<tr>
<td></td>
<td>Use a diagram or model to demonstrate knowledge of geographic concepts, to illustrate a process, cycle, relationship, or system, or to find solutions to geographic problems.</td>
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</tbody>
</table>

*(Solem, Stoltman et al., 2018)*
(Chang, Kidman et al., 2019)
### INTEGRATED FRAMEWORK FOR GEOGRAPHY EDUCATION: CURRICULUM, COMPETENCES AND ASSESSMENT

<table>
<thead>
<tr>
<th>Geographical Knowledge (powerful geography)</th>
<th>Knowing/reasoning</th>
<th>Geographical thinking/knowledge</th>
<th>Critical thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical skills (useful geography)</td>
<td>Applying</td>
<td>Spatial thinking</td>
<td>Analytical thinking</td>
</tr>
<tr>
<td>Geographical practices (transformative geography)</td>
<td>Practicing</td>
<td>Spatial citizenship</td>
<td>Lateral thinking</td>
</tr>
</tbody>
</table>

*(De Miguel, 2021)*
Geography is the most interdisciplinary subject in school, allowing students to learn physical and social environment vocabulary, processing meaningful statistics, implement scientific methods, acquire personal and social (territorial) identity and citizenship, develop cultural awareness from natural and human landscapes, etc. Consequently, geography is the best subject to promote sustainable development (goals) education from a comprehensive approach: economic, social, political and environmental.
Table 1. Relationships between geography and SDG’s

<table>
<thead>
<tr>
<th>SUSTAINABLE DEVELOPMENT GOALS</th>
<th>GEOGRAPHICAL STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG 1. NO POVERTY</td>
<td>SOCIAL AND ECONOMIC GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 2. ZERO HUNGER</td>
<td>SOCIAL AND RURAL GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 3. GOOD HEALTH AND WELL-BEING</td>
<td>SOCIAL GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 4. QUALITY EDUCATION</td>
<td>SOCIAL GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 5. GENDER EQUALITY</td>
<td>SOCIAL GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 6. CLEAN WATER AND SANITATION</td>
<td>HYDROGEOGRAPHY</td>
</tr>
<tr>
<td>SDG 7. AFFORDABLE AND CLEAN ENERGY</td>
<td>INDUSTRIAL GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 8. DECENT WORK AND ECONOMIC GROWTH</td>
<td>ECONOMIC GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 9. INDUSTRY, INNOVATION AND INFRASTRUCTURE</td>
<td>TRANSPORT AND ECONOMIC GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 10. REDUCES INEQUALITIES</td>
<td>REGIONAL GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 11. SUSTAINABLE CITIES AND COMMUNITIES</td>
<td>URBAN GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 12. RESPONSIBLE CONSUMPTION AND PRODUCTION</td>
<td>ECONOMIC GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 13. CLIMATE ACTION</td>
<td>CLIMATOLOGY</td>
</tr>
<tr>
<td>SDG 14. LIFE BELOW WATER</td>
<td>BIOGEOGRAPHY AND HIDROGEOGRAPHY</td>
</tr>
<tr>
<td>SDG 15. LIFE ON LAND</td>
<td>BIOGEOGRAPHY</td>
</tr>
<tr>
<td>SDG 16. PEACE, JUSTICE AND STRONG INSTITUTIONS</td>
<td>POLITICAL GEOGRAPHY</td>
</tr>
<tr>
<td>SDG 17. PARTNERSHIPS FOR THE GOALS</td>
<td>POLITICAL GEOGRAPHY</td>
</tr>
<tr>
<td>1. Information and data literacy</td>
<td>1.1 Browsing, searching and filtering data, information and digital content</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>2. Communication and collaboration</td>
<td>2.1 Interacting through digital technologies</td>
</tr>
<tr>
<td></td>
<td>2.4 Collaborating through digital technologies</td>
</tr>
<tr>
<td>3. Digital content creation</td>
<td>3.1 Developing digital content</td>
</tr>
<tr>
<td></td>
<td>3.4 Programming</td>
</tr>
<tr>
<td>4. Safety</td>
<td>4.1 Protecting devices</td>
</tr>
<tr>
<td></td>
<td>4.4 Protecting the environment</td>
</tr>
<tr>
<td>5. Problem solving</td>
<td>5.1 Solving technical problems</td>
</tr>
<tr>
<td></td>
<td>5.4 Identifying digital competence gaps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Levels in DigComp 1.0</th>
<th>Levels in DigComp 2.1</th>
<th>Complexity of tasks</th>
<th>Autonomy</th>
<th>Cognitive domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Simple tasks</td>
<td>With guidance</td>
<td>Remembering</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Simple tasks</td>
<td>Autonomy and with guidance where needed</td>
<td>Remembering</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Well-defined and routine tasks, and straightforward problems</td>
<td>On my own</td>
<td>Understanding</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tasks, and well-defined and non-routine problems</td>
<td>Independent and according to my needs</td>
<td>Understanding</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Different tasks and problems</td>
<td>Guiding others</td>
<td>Applying</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Most appropriate tasks</td>
<td>Able to adapt to others in a complex context</td>
<td>Evaluating</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Resolve complex problems with limited solutions</td>
<td>Integrate to contribute to the professional practice and to guide others</td>
<td>Creating</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Resolve complex problems with many interacting factors</td>
<td>Propose new ideas and processes to the field</td>
<td>Creating</td>
<td></td>
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</tbody>
</table>
YouthMetre: Forward Looking Project

- YouthMetre creates a ‘forward-looking tool’ for youth participation
- based on Education, Training & Youth (ETY)
- identifying, testing, developing, assessing **new innovative approaches** in ETY
- innovation in **practices and policies** for Youth
- Addresses Priority 7:
  - “Using e-participation as an instrument to foster young people's empowerment and active participation in democratic life”
  - Importance of **geospatial information, data and geography education** in non formal contexts (youth civil society organizations and youth grassroots organizations)
Youth Development Index at NUT 2 (2015)

Synthetic Index IN 2015

- > 95 to 98.2
- > 90 to 95
- > 85 to 90
- > 80 to 85
- > 75 to 80
- > 70 to 75
- > 65 to 70
- > 57.5 to 65
**Teacher training modules**

- **Module 0: Digital Citizen Introduction**
- **Module 1: Information & Data Literacy**
- **Module 2: Digital Content Creation**
- **Module 3: Communication & Collaboration**
- **Module 4: Problem Solving: The 15 Minute City**

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**Figure 4. Conceptual Framework to support greater use of open data in learning (Coughlan, 2019)**

- **Rationale**
  - Use advanced possibilities for subject matter teaching
  - Develop public engagement through open data with authentic inquiry
  - Use relevance and broad scope to motivate and develop data literacies

- **Pedagogy**
  - Inquiry-based learning
  - hammel nerations
  - Personalization
  - Process-based assessments

- **Making data usable**
  - Find data for a purpose
  - Find raw data
  - Monitor accuracy and change
  - Define and curate data
  - Find or create tools suited to learning with open data
  - Check formats and documentation

- **Develop literacies**
  - Develop educator data literacies
  - Develop student data and digital literacies
  - Manage data literacy requirements
  - Combine subject knowledge and data literacies

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**Integrate education with open data use across society**

- Inclusive education with policies and governance
- Work with the supply and demand for open data
- Develop public engagement with open data
- Create real world impacts

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**Open data charter**
**VIGNETTE: Physical Landscapes**

**Step 1:** Identify a topic or story that is going to be told/explained using GIS

**Step 2:** Teach with GIS

**Step 3:** Curriculum content - secondary geography - introduction to the physical environment

**Step 4:** Learning objectives

- Introduce prior learning about different types of physical environment that exist
- Describe the location of specific examples of landscapes and explain links between them
- Describe, explain and evaluate possible influences on this location and distribution. Link to SDGs.

**Step 5:** GIS teaching

- Individual exploration: Using ArcGIS map of Physical landscapes, students select a location and answer questions about different types of landscapes including the world's largest desert and their distribution.

**Step 6:** GIS teaching

- Class review/discussion: How do the physical landscapes vary in different parts of the world? Why do they vary?

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**Home - Physical Landscapes of the world**

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**Physical Development Goals**

- Sustainable Development Goals
- "No Poverty"
- "Zero Hunger"
- "Clean Water and Sanitation"
- "Quality Education"
- "Good Health and Well-being"
- "Gender Equality"
- "Clean Energy"
- "Affordable Housing"
- "Climate Action"
- "Life on Land"
Aligning frameworks and pedagogies in school and higher education to the Revised Guide to the Role of Standards in Geospatial Information Management

GEOSPATIAL TECHNOLOGIES AS AN ONLINE RESOURCE FOR ALL

“Geo-Enabling the Global Village: No one should be left behind”, the second UNWGIC
Geo Tools for Modernization and Youth Employment

My GEO Project  Intellectual Outputs  News
MOOC for teachers

Aim: promoting modernization of methods and tools for teaching and learning through the use of GIS

Online course, favoring the acquisition of key competences related to the use of GIS in higher education courses

Including examples on use of GIS

Portfolio GIS: Mooc for students

Aim: fostering the ability of students to demonstrate the skills acquired in the use of GIS applications → labour market

Based on what companies want/need

Each competency → part of the MOOC
European mobility

- Formalisation of MY GEO MOBILITY training methodology students aimed at acquiring GIS related skills via international mobility in companies
- Tested in 2 cycles of each 8 students (2 of 4 univ each), 300 h internship in companies of consortium
- Contains set key competencies acquired in mobility, methodology for ‘on the job’ training, and asessment
Breath and Types of Knowledge And Ratio of Number of Users at Different Levels of Use

Geospatial Technology Competency Model
SURVEY MY GEO PROJECT

MY GEO ("Geo tools for Modernization and Youth Employment", 2018-1-IT02-KA203-048193) is an European project that aims to improve the capabilities of graduate students for their incorporation to the geospatial industry. In this way, the project is working on the identification of a set of key competences related to the use of geo-information tools (GIS), in particular the most relevant for the labor market, in order to implement a training course. This project also seeks to define a "learning line" and a competences assessment framework, allowing to measure the impact of this training on learners' knowledge and competences, according to the industry needs.

In this context, MY GEO project will appreciate your collaboration for the identification of the key competences that students should acquire in order to increase their employability. Taking your answers in consideration, the project will create a MOOC addressed to students interested in the acquisition of more accurate skills and competences, as requested by companies in their job demands.

Thanks a lot for your collaboration and your time. Average time to answer this survey: 3 minutes.

Dr. Rafael de Miguel González
Professor of Geography, University of Zaragoza (Spain)
President of EUROGEO
Survey for companies

72 answers coming from...

Company size: number of employees (European Commission Recommendation 2003/361/CE)

52 respuestas

Geographical scope of business

52 respuestas
Principal sector of your clients

52 respuestas

- Agriculture and rural development: 21 (40.4%)
- Energy and water: 18 (34.6%)
- Engineering: 17 (32.7%)
- Environment: 20 (38.5%)
- Financial, insurance: 9 (17.3%)
- Health and human services: 5 (9.6%)
- IT: 11 (21.2%)
- Manufacturing: 3 (5.8%)
- Public administration: 25 (48.1%)
- Public safety: 8 (15.4%)
- Retail: 6 (11.5%)
- Transportation: 12 (23.1%)
- Tourism: 2 (3.8%)
- Utilities & Telecom: -1 (1.9%)
- Telecommunications (Asset): -1 (1.9%)
- M...: -1 (1.9%)
- Defence: -1 (1.9%)
- Urbanism: -1 (1.9%)
- Various: -1 (1.9%)
SELECT THE THREE SKILLS MORE VALUABLE FOR YOUR COMPANY

ANALYTICAL AND CRITICAL THINKING

- Creative Thinking: 33 (63.5%)
- Knowledge Management: –14 (26.9%)
- Model Building Skills: –21 (40.4%)
- Problem-Solving Skills: –38 (75%)
- Research Skills: –9 (17.3%)
- Technical Writing: –11 (21.2%)
- Technological Literacy: –10 (19.2%)

INTERPERSONAL COMPETENCIES

- Coaching: –13 (25%)
- Communication: 39 (75%)
- Conflict Management: –9 (17.3%)
- Feedback Skills: –10 (19.2%)
- Group Process Understanding: –12 (23.1%)
- Leadership Skills: –19 (36.5%)
- Questioning: –14 (26.5%)
- Relationship Building Skills: –15 (28.8%)
- Self-Knowledge/Self-Management: –31 (58.8%)

BUSINESS COMPETENCIES

- Ability to See the “Big Picture”: –16 (30.8%)
- Business Understanding: –3 (5.8%)
- Buy-in/Advocacy: –19 (35.5%)
- Change Management: –13 (25%)
- Cost Benefit Analysis/ROI: –20 (38.5%)
- Ethics Modeling: –4 (7.7%)
- Industry Understanding: –13 (25%)
- Legal Understanding: –17 (32.7%)
- Organization: –9 (17.3%)
- Visioning: –15 (28.8%)

TECHNICAL COMPETENCIES

- Geospatial Sensors: 22 (43.1%)
- Cartography and graphic representation: –31 (60.8%)
- Computer Programming Skills: 25 (48%)
- GIS Theory: –5 (9.8%)
- Photogrammetry: –8 (15.7%)
- Topology: 4 (7.8%)
- Communication network: –12 (23.5%)
- Spatial reference systems: –17 (35.3%)
- Mobile apps: –7 (13.7%)
- Scale and resolution: –1 (2%)
- Remote sensing and mapping: –1 (2%)
RATE FROM 1 (POORLY RECOMMENDED) TO 5 (STRONGLY RECOMMENDED)
ACCORDING TO YOUR COMPANY EMPLOYEES PROFILE

DATA SOURCE

STORE

ANALYSIS

DATA GEOMATICS
United Nations Habitat Professionals Forum
The 2022 Roadmap to Recovery

Background Report
April 2022

Harnessing New Digital Technologies for Intelligent Cities and Smart Communities

Box 1: Core Geospatial Capabilities

- A Common Spatial Data Environment based on National Mapping and Geospatial: the map and data sets (key environmental, socio-economic & public health data) that would enable every basin study including forecasting, simulation, modeling, and monitoring for the country to be specified and collated centrally.

- A National Network of Regional Data Observatories: based on Regional Data Inlet regional networks linked with collecting and analyzing demographic, economic, social and environmental data should be created.

- An Integrated Planning Open Data Framework based on Planning Data Inlet: digital planning support systems need to be designed to capture back-office data in an integrated open data framework with decision support and public consultation functions.

- Planning Metrics and Information Management Standards: certifying planning metrics and information management standards to enable the twin pillars of development control and plan-making to be coordinated and synergized.

- Digital Tools and Techniques: a diverse range of digital tools and techniques which can be employed and integrated in spatial planning should be introduced to planners.

94. There are three critical issues that need to be addressed if this is to be achieved: (i) agreed key performance indicators; (ii) better access to available data; and (iii) the harmonization of smart technologies and new big data sources. These are discussed below and collectively call for the development of linked national and regional UN-Habitat Knowledge Hubs, building on the experience of for example, the Johns Hopkins Coronavirus Dashboard and the CAA Data Platform.

* A Digital Core for Planning Full Report (link to be added)
* COVID-19 Map: Johns Hopkins Coronavirus Resource Center (link to be added)
* UN-Habitat Planning for Urban Change and Urban Informatics (www.unhabitat.org)

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Questions...?

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Thanks so much 🤗

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