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What is the *Subject Diagnosis Tool*?

The *Subject Diagnosis Tool* is designed for educators to assess their own subjects, whether they have spent enough time on what they deem to be important in the subject and if there is a specific requirement or adjustment focus on their subjects. It helps in narrowing focus of subject and reducing possibly unnecessary resources spent on topics that may not be beneficial towards the development of student's knowledge

Expected desirable outcomes

For Educators:

- ❖ To assess the condition of their own subject
- ❖ To be able to compare with other educators regarding the conditions of their subjects
- ❖ To have a better understanding of the distribution of time and effort placed on various topics of their subjects

Design of the *Subject Diagnosis Tool*

The *Subject Diagnosis Tool* is designed as a self-assessment tool, a tool for profiling the subject/course/programme in order to have a better understanding of the allocation of time and the Educator’s perception within a chosen subject/course/programme. It can be used for a single subject, a course (specialism) or a programme. There are currently 2 versions of the *Subject Diagnosis Tool*:

Fixed Version: Enables Educators to compare their course with the characteristics and elements identified to be important in Geospatial Education. Users of this version can interact with the tool via the input of Level of Understanding required for the particular topic/ subject/ course/ programme, Perceived Importance and amount of Allocated Hours (including lectures, lab times, and tutorials) per week.

The screenshot shows an Excel spreadsheet with the following structure:

Item	Description	Level	Perceived Importance	Allocated Hours
BKnoG02	Regions and boundaries	3	High	3
BKnoG03	Relationship and differences between local-national-regional-global scales	2	Medium	2
BKnoG04	Relationship between coverage and spread of Geographical phenomena	1	Low	1
BKnoG05	Movement of geographical features & phenomena, links and relationship between movement	0	Not Applicable	0
BKnoG06	Human-Environment interaction			
BKnoG07	Impacts of specific/localized phenomenon			
BKnoG08	Effect of culture on Geography and perception of geographic phenomena and its relationships			
SupKnoG01	BIM			
	Concepts and purpose of BIM and the role that it plays in the field of construction			
	Applications of BIM in other fields and its integration into the building life-cycle			
	BIM techniques to assist in decision-making			
	Process involved in production of BIM and the effects it could have on overall outcome			
	Information requirements as required by the various stakeholders and the			

Annotations:

- Topic, Subject, Course or Programme information:** Points to the 'Course/Subject' dropdown menu in row 8.
- Pre-set descriptors, cannot be changed:** Points to the 'Item' and 'Description' columns.
- Expected Level of understanding Students can achieve:** Points to the 'Level' column.
- Perceived Importance of a particular skill/knowledge:** Points to the 'Perceived Importance' column.
- Amount of total Contact Hours the Student receives (including, but not limited to, tutorials, lectures, student appointments):** Points to the 'Allocated Hours' column.
- Input details of study then Diagnose its status:** Points to the 'Input' button at the bottom left.
- To CLEAR all input in the particular column or CLEAR ALL input within the file:** Points to the 'CLEAR', 'CLEAR ALL', and 'CLEAR ALL' buttons.

Customizable Version: Enables Educators input their own descriptors, allowing higher levels of customization, but still allows Educators to compare how their course/subject/topic/programme is performing. Though it has higher flexibility, it requires higher amounts of user input.

The screenshot shows an Excel spreadsheet titled "Subject Diagnosis Tool" with the following columns and rows:

Expected Level of Understanding	Perceived Importance	Level of Contact
L4 Analyze, theorize, hypothesize & justify (new) knowledge	3 High	3 High amount of contact
L3 Compare & explain theories	2 Medium	2 Average amount of contact
L2 Demonstrate comprehension & application of knowledge	1 Low	1 Minimum amount of contact
L1 Recall knowledge, do simple procedures & calculations	0 N/A	0 No contact

Foundation/ Core/ Specialized	Area	Topic	Description (e.g. Key Concepts, Key Messages, Intentions, Outcomes)	Mode of Teaching/ Learning	Skill Set	Expected level of Understanding	Level of Perceived Importance	Allocated Hours (Per Week)

Annotations:

- Subject/Course information:** Points to the "Subject/Course" input field.
- Expected Level of Understanding (L1-L4) Students can achieve:** Points to the "Expected Level of Understanding" column.
- Perceived Importance (0-3) of a particular skill/knowledge:** Points to the "Level of Perceived Importance" column.
- Amount of total Contact Hours the Student receives (including, but not limited to, tutorials, lectures, student appointments):** Points to the "Allocated Hours (Per Week)" column.
- Identify the type of Knowledge (Foundation, Core, Specialised) categories based on the Geospatial Curriculum:** Points to the "Foundation/ Core/ Specialized" column.
- Input details of study then Diagnose its status:** Points to the "Input" and "Diagnose" buttons at the bottom.
- Descriptor for the item:** Points to the "Description" column.
- Identify how the topic is taught and/or learnt by students:** Points to the "Mode of Teaching/ Learning" column.
- Indicate the types of skills the particular topic is attempting to cultivate in students:** Points to the "Skill Set" column.

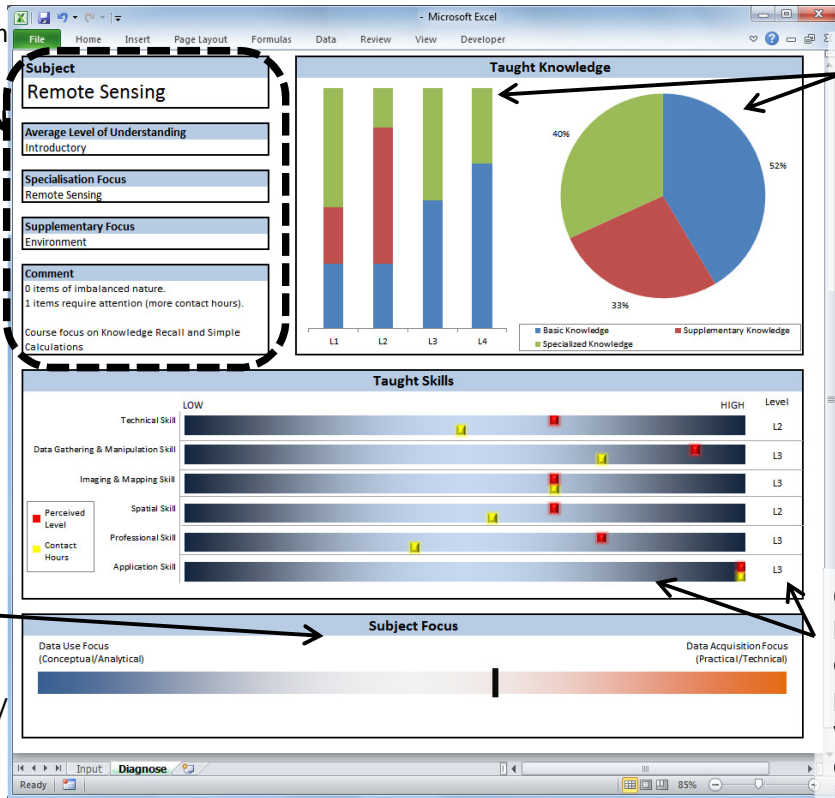
How to use the *Subject Diagnosis Tool*

This tool can help educators visualize how their subjects/course/program is faring and allows educators to compare their own subjects with the status of other subjects with ease regardless of the specialty/discipline.

Fixed Version

NB. Assumes the assessed Topic/Subject/Course/Programme is Geospatial based.

Description from computer diagnosis.



Comparison of level of taught knowledge with the amount of time spent and the composition of knowledge at each level

Computer diagnosis of focus of Topic/ Subject/ Course/ Programme

Comparison between the levels of understanding, perceived levels with the amount of contact hours spent

Level of Understanding	Description	Perceived Importance	Allocated Hours (per week)
L4	Analyze, theorize, hypothesize & justify (new) knowledge	3 High	3 >= 5 Hours allocated contact hours
L3	Compare & explain theories	2 Medium	2 = 4 Hours allocated contact hours
L2	Demonstrate comprehension & application of knowledge	1 Low	1 <= 3 Hours allocated contact hours
L1	Recall knowledge, do simple procedures & calculations	0 Not Applicable	0 <= 3 Hours allocated contact hours
L0	Not Applicable	0 Not Applicable	0 No hours allocated

Item	Description	Level	Perceived Importance	Allocated Hours
SSkill03	Concept of 'spatial data'	L3	2	2
PSkill01	Scope of work	L4	3	2
PSkill02	Communicate, defend and explain reasoning behind use of data/technology/application	L3	2	1
PSkill03	Relationships between different parties and fields within scope of work	L1	2	1

Highlight of items with High importance

Identifies items with requires **ATTENTION** (mismatch between perceived importance with expected level of understanding and/or contact hours)

Customizable Version

Subject/Course
Fundamentals of Geographic Information Science

Average Level of Understanding
L2

Important Topics

Topic	Importance
Earth	3.00
Coordinate Systems	3.00
Map Reading	3.00
Geospatial ToolBox	2.75
Geospatial Data Structure	2.50
Database	2.00
Spatial Analysis	2.00
Geospatial Software	2.00
Data Visualization	1.53
OutPlace	0.00
Other	0.00

Skill Ranking

Skill	Frequency
Data Gathering & Manipulation Skills	6
Imaging, Mapping & Visualization Skills	5
Technical & Practical (Hands-on) Skills	4
Spatial Skills	3
Other	3
Other	1

Taught Knowledge

Detailed Information

Topic	Independent Learning/Research	Interactive Learning/Social Learning	Instructive Teaching	Field Hands-on Experience	Online Learning/Case Studies	Other
GIS	0	0	2	2	0	0
CAD	0	0	0	0	0	0
Program Customization	0	0	0	0	0	0
Geospatial ToolBox & Hardware	0	0	0	0	0	0
Other	0	0	0	0	0	0

Description from computer diagnosis.

Distribution of Level of Understanding within Topic/ Subject/ Course/ Programme

Distribution of Knowledge types within Topic/ Subject/ Course/ Programme

Distribution of Tuition method used to teach various types of Knowledge

Computer diagnosis of degree of Geospatialism and Technicality of Topic/ Subject/ Course/ Programme

Expected Level of Understanding

Expected Level of Understanding	Revised Importance	Allocated Hours (per week)
L4 Analyze, theorize, hypothesize & justify (new) knowledge	3 High	3 > 3 Hours allocated contact hours
L3 Compare & explain theories	2 Medium	2 = 2 Hours allocated contact hours
L2 Demonstrate comprehension & application of knowledge	1 Low	1 < 3 Hours allocated contact hours
L1 Recall knowledge, do simple procedures & calculations	0 N/A	0 No hours allocated

Subject/Course
Fundamentals of Geographic Information Science

NOTE: 3 highlighted items require attention. Please review level of expected understanding with allocated hours (Per Week)

Foundation/ Core/ Specialized	Area	Topic	Description (e.g., Key Concepts, Key Messages, Intentions, Outcomes)	Mode of Teaching/ Learning	Skill Set	Expected Level of Understanding	Perceived Importance	Allocated Hours (Per Week)
Core	GeospatialToolBox	GIS	Evolution of GIS	Instructive Teaching	Others	L2	3	2
Core	GeospatialToolBox	GIS	Basic Functions of GIS	Field/ Hands-on Experience	Imaging, Mapping & Visualization Skills	L2	3	3
Core	GeospatialToolBox	GIS	GIS Via CAD	Field/ Hands-on Experience	Technical & Practical (Hands-on) Skills	L3	2	2
Foundation	Earth	Model	Real world modelling	Instructive Teaching	Data Gathering & Manipulation Skills	L3	3	1
Core	DataAcquisitionConcept	Quality of Data	Spatial data quality	Instructive Teaching	Data Gathering & Manipulation Skills	L2	3	3
Foundation	CoordinateSystems	Scale	Scale & generalization	Field/ Hands-on Experience	Imaging, Mapping & Manipulation Skills	L2	3	3
Core	GeographicalDataStructure	Map Indexing	Georeferencing	Field/ Hands-on Experience	Data Gathering & Manipulation Skills	L3	3	2
Core	SpatialAnalysis	Spatial Relationships	Spatial Analysis	Field/ Hands-on Experience	Imaging, Mapping & Manipulation Skills	L3	2	2
Core	GeospatialToolBox	GIS	GIS components	Instructive Teaching	Others	L2	3	1

Makes note and identifies items with requires **ATTENTION** (mismatch between perceived importance with expected level of understanding and/or contact hours)

Troubleshooting

1. Cannot enter values in **Input**

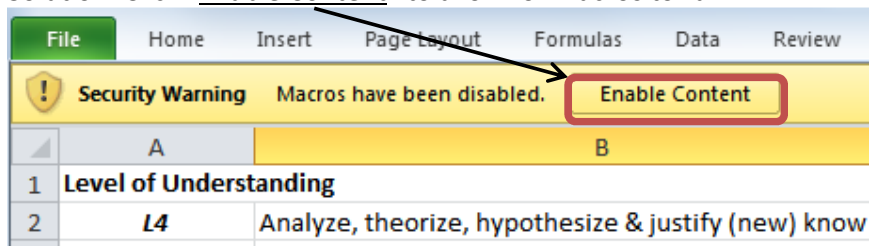
Solution: Do not enter value directly using the keyboard, select via dropdown menu and on



To access dropdown menu, select the cell first. All entry values (with the exception of Descriptions) have to be entered this way.

2. Security warning displayed

Solution: Click “Enable Content” to allow for macros to run



3. Cannot run file

Solution: Please ensure you are running Windows Office from a desktop computer and not via the Internet (i.e. please download file first onto desktop and not run directly from the browser or using Internet version of Windows Office). If running from an older Windows Office (before Windows Office 2010), you may want to consider using the non-macros version (please note, this is only available for the *Fixed Version*).

4. Want to make notes on the file itself

Solution: Unfortunately, this feature is not available for both versions

5. Will not **Diagnose**

Solution: (a) Save file, close application fully, open file again. (b) Display **Input** again then **Diagnose** to refresh

6. Not enough input lines

Solution: Unfortunately, the current *Customizable Version* can only cater for 240 lines of input.

7. Screen froze during input/reaction is slow

Solution: Please allow some time for calculations to be made, it can take a few minutes depending on the machine and the amount of input.

Suggested applications

This tool can be used for both assessing existing subject plans and for planning a new subject plan. For new subject plans, educators can input the intended number of contact hours to visualize the various aspect. For existing subjects, educators can visualize the amount of time with respect of the level of importance, to help better manage the limited contact hours.

Share your Ideas

Send us your ideas and share with fellow educators on:

Geo-spatial Education Platform: <http://www.polyu.edu.hk/proj/gef/>

Email: lsgi.gef@polyu.edu.hk