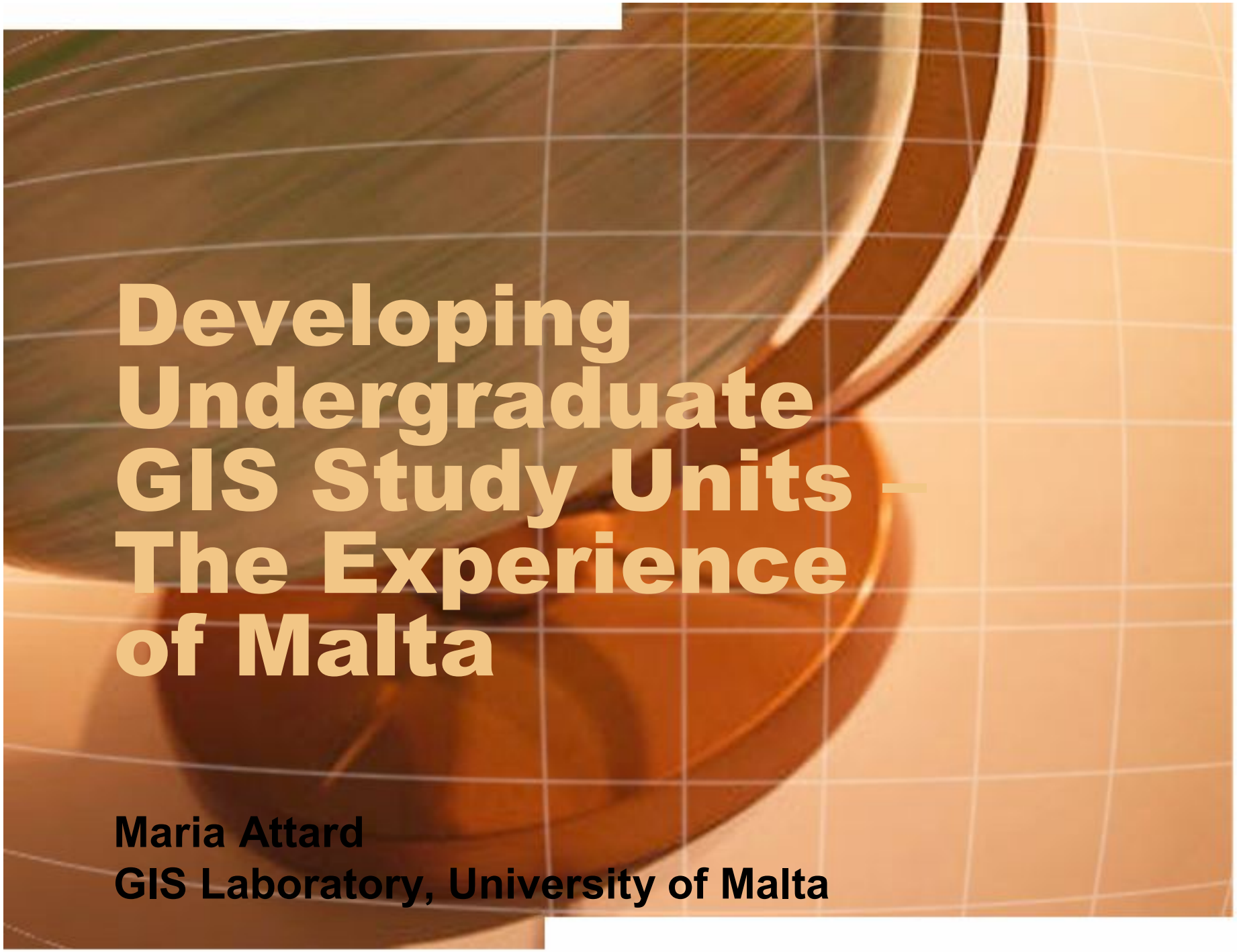

Developing Undergraduate GIS Study Units – The Experience of Malta

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Objectives

- Identify opportunities and problems of developing undergraduate study units in GIS.
- Course development and multi-disciplinary approaches.
- Using experience gained in teaching GIS at University of Malta.

GIS at the University of Malta

- GIS Lab set up in 1996
- Supported by ESRI
- Initial introductory courses for IT and Geography students
- Faculties serviced today include Geography, Education, Biology, Engineering, Architecture, Archaeology etc.
- In 2004, 20% of the geography graduates have been employed directly in GIS (agriculture, transport, mineral resources management).
- A number of students are currently doing their post-graduate in GIS (mostly through distance learning)

Key elements of a GIS Study-unit

- Understanding your audience
- Components of a GIS study-unit
- Coordination of lectures and practical sessions
- Use of teaching aids

Understanding your audience

- Varying computer skills
- Understanding of spatial relationships
- Value of spatial data
- Multi-disciplinary approach to university studies reflect a mixture of students in one class

Components of a GIS Study-unit

- One semester introductory course in undergraduate programme
- Structure has changed over time to include more hands-on sessions
- Rationalise theoretical aspect to main concepts (supported by literature)
- Typical course structure …

Session title	Description
Defining GIS	Definitions of GIS and development of the technology
Data types and sources	Define spatial and non-spatial data and the source of digital data (both locally and abroad)
Data quality	Managing data error and ensuring data quality
Data input	Describing the various methods of data input with advantages and disadvantages
Demonstration and hands-on	*Software demonstration on how various data input methods are used*

Data structure and management	**Defining vector and raster data structures and the use of DBMS**
Analysis and visualisation	**Describing the various methods of data analysis available in the software and the basic visualisation rules of cartography**
Demonstration and hands-on	***Using previous data inputted in a project, data analysis is performed and a map output is prepared for printing***
Implementation	**Describing the various applications of GIS and the elements necessary for implementation of a GI system**
Practical sessions	**The remaining weeks see the students applying GIS to a particular project of their choice where data is collected, inputted, analysed and map outputs are produced together with a written report.**

Components of a GIS Study-unit cont…

- The core topics are always the same.
- Structure of study unit changes according to student demands.
- On-going process to improve understanding of GIS at undergraduate level.

Coordination of lectures and practical sessions

- Depends on time (credit system in place) and resources (computers and software).
- Theoretical part along practical part.
- Plenty of time for student to practice use of software (learning by own mistakes).
- Written reports of work include map outputs from their practical sessions.

Use of teaching aids

- GIS is a young technology developed alongside the internet.
- Examples of resources include ESRI Virtual Campus, online libraries, conferences.
- Textbooks with software and exercises in a number of fields.
- Educational textbooks for classroom work.
- Appropriate use of ICT tools such as real-time software demonstrations and connections to internet.

Multi-disciplinary GIS

- Instructor's disposition to the different applications of GIS.
- Academic courses versus professional courses.
- Industry specific applications,
- Some textbooks are available on particular subjects (eg. Education).

Role of the student

- Very important participatory role.
- Depends on adaptability to new computer software.
- Importance of hands-on experience.
- Extensive literature review (esp. internet).
- Site visits to industry were possible.

Conclusions

“Demands for geo-spatial skills is increasing with more scientists required to understand the processes of integrating use of GIS with spatial phenomenon. This on its own should be an incentive for higher education to invest in the teaching of GIS as early as undergraduate programmes.”

THANK YOU

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