



Linking GIScience Research and Undergrad Teaching

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Motivation

- National Science Foundation Programs encourage making links between research and teaching
- Brief overview of these experiences in chronological order



GIS Program in Geog – 10 courses; 5 courses have made a link

- Geog 360 Principles of Cartography
 - Decision Support Software Usability
- Geog 461 Urban GIS
 - Site Selection Using GeoChoicePerspectives
- Geog 463 GIS Workshop
 - Hanford Land Use Plan Development
- Geog 465 Analytic Cartography
 - Java Programming in PGIST Web-based GIS
- Geog 460 Geographic Information Systems Analysis
 - Coastal Data Modeling



1996 -

Geog 360 Principles of Cartography

- Research-teaching activity about decision support software usability included five students...
 - Critiquing a database for salmon habitat site selection
 - Taking part in an alpha usability test of a groupware program called SpatialGroupChoice as their final project
- Outcomes...
 - Produced a report of their findings
 - Useful for upgrading the software and the database for a new round final testing with the beta version of the software.



1999 - Geog 461 Urban GIS

- Research-teaching activity about GIS-based decision support tools included three students...
 - Developing a database for wastewater facility siting using multiple stakeholder groups
 - Making use of GeoChoicePerspectives software to repeat the site selection process using a multi-criteria decision software rather than the ArcGIS software with those stakeholder groups.
- Outcomes...
 - Final project report describing all steps in the process
 - A database that other students can extend



2002 - Geog 463 GIS Workshop

- Research-teaching activity about a stakeholder-driven land-use plan included a five-student group...
 - Understanding the process of project development
 - Translating datasets available for US Dept of Energy into land-use overlays for each of several stakeholder groups
 - Performing overlay data analysis
- Outcomes...
 - Compiled and presented a full-scale project report about the stakeholder-driven land use plan for Hanford



2005 –

Geog 465 Analytic Cartography

- Research-Teaching activity about Java programming involved 25 students who...
 - Participated in team projects undertaking web GIS development for the Participatory GIS for Transportation (PGIST) project
 - Were introduced to the basics of Internet-based GIS using the Java J2EE
 - Investigated Web GIS applications using ESRI's ArcGIS Server with ArcObjects
- Outcome...
 - Web GIS software prototypes – kind of...



2006 - Geog 460 Geographic Information Systems Analysis

- Research-teaching activity about coastal data modeling included three students undertaking...
 - Data model development for coastal datasets, particularly comparing the ArcMarine and ArcHydro data models to form a Coastal Data Model
 - Use of a prototype coastal data model to develop a nearshore coastal database for King County WA
- Outcomes...
 - Coastal data model report
 - Prototype of Nearshore Coastal Database for use in course



Conclusion - Lessons Learned

- Course design, like research, is a matter of striking a balance among concepts, methods and substance – the three domains that underpin knowledge creation
- When planning a teaching-research link (an instructor should) ground the research experience in the substantive domain, then convey method and concept through that substance



Conclusion - Lessons Learned

- Make research activity available as one among several project options for students; some students want little to do with advanced knowledge exploration; while others are engaged
- Student time and energy is not being exploited... considerable resources involved in making sure students have a valuable learning experience, sometimes at the expense of the research project
- All of this takes more time than initially expected, but the reward for those involved is worth it



Thank You – Comments/Questions?

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