

**Background**

In Spring 2011, the authors received a 3 year **NSF TUES grant** to develop, validate, & disseminate sets of POGIL activities for CS; and next, to foster a POGIL community within CS.

**Key components** include:

- Activities developed & piloted by CS faculty with POGIL experience.
- Reviewed by 2 chemistry faculty with extensive POGIL experience.
- Reviewed & tested by CS faculty with POGIL workshop training.
- Consulting from assessment expert.
- Dissemination via workshops, etc.

**Table 1: Project Timeline** (PA=POGIL activity)

When	PI & co-PIs	CS Collaborators
2011 Summer	plan assessment create/refine PAs	POGIL training review PAs
2011-12 Year	pilot/refine PAs show: talks	review/pilot PAs eval (baseline)
2012 Summer	create/refine PAs	POGIL training review/refine PAs
2012-13 Year	refine PAs push: workshops	eval (baseline & treatment)
2013 Summer	create/refine PAs	create/refine PAs
2013-14 Year	refine PAs push: talks & workshops	eval (treatment) pilot/refine PAs

**Status**

To date, we have drafted, piloted, & revised POGIL activities for:

**Programming**

1. Unit Testing (JUnit)
2. Error Handling & Exceptions
3. File Input & Output
4. Object-Oriented Design
5. Object-Oriented Inheritance

**Data Structures & Algorithms**

6. Searching (linear & binary)
7. Queues
8. Stacks
9. Linked Lists
10. Maps & Hash Tables
11. Sorting (mergesort & quicksort)
12. Bioinformatic Sequence Analysis

**Software Engineering**

13. Teams & Roles (introductory)
14. Software Life Cycles
15. Risk Management
16. Scheduling (PERT, critical path)
17. UML Analysis Diagrams
18. UML Design Diagrams
19. Task Tracking
20. Version Control

**Collaborators**

- 5 CS faculty
- 2 CS teachers (high school)
- 5 CS undergraduate
- 6 CS faculty across southern India

**Education & Outreach**

*t=talk, w=workshop/tutorial*

- T4E'12. Hyderabad, India (t, w)
- CS&IT'12. Irvine. (w)
- ASEE'12, San Antonio. (t)
- SIGCSE'12. Raleigh. (t, w)
- CCSCE'10. Juniata Coll. (w)
- CCSCNE'11 WNE Univ. (w)
- NCIIA'12, San Francisco. (t)
- 5 lectures & workshops. Kochi, Trivandrum, Hyderabad, India.
- Project kickoff. Muhlenberg Coll.

**Table 2: Project Assessment**

	Goal: Enhance...	Assessed using...
Students	Learning outcomes.	Grade distributions. Qualitative assessment of some assignments.
	Affective outcomes.	Current (e.g. SIR-II), existing (e.g. TDS), & custom instruments.
	Recruiting & retention.	Course enrollments & major/minor counts.
PIs & CS Faculty	Quality of PAs.	Activity reports, peer review, interviews.
	Affective outcomes.	Reflection, interviews.
	Tech (FOSS) to support PAs.	Activity reports, peer review, interviews.
	Awareness (talks/papers/workshops).	Activity reports, interviews.
	CS-POGIL community.	Attendance & evaluation forms.

**Conclusions**

POGIL fits CS well, since CS students must master fundamental concepts; learn to work in teams; and learn how to learn new theories & tools.

POGIL in CS presents **opportunities**:

- Explore new topics(s) & discipline(s).
- Explore concepts & techniques that span disciplinary boundaries.
- Produce tools for the broader POGIL community.

POGIL in CS also presents **challenges**:

- Few activities, emerging community.
- Content changes & evolves quickly so developing activities is difficult.
- Curricula vary widely – intro courses use varied approaches & languages, making reuse difficult.

Future plans include more activities, and fostering a broader community of educators in CS & other areas.

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**Sample References**

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