Developed Investigative Case Based Learning (ICBL), a science teaching method that addresses the project goals:

- Created over 65 ICBL curriculum modules
- Created a web site rich in resources
- Prepared a cadre of college STEM faculty to use and disseminate ICBL
- Disseminated ICBL to STEM faculty in two and four year colleges and research universities
- Demonstrated that ICBL is useful in many STEM disciplines
- Assessed the use of ICBL modules in college classrooms

The LifeLines model of faculty development engaged faculty in:
- experiencing ICBL approaches as both learner and teacher,
- learning effective uses of instructional technology using “just in time” teaching,
- designing their own ICBL modules,
- having their work published on the web,
- planning how to implement their modules, and
- planning to collect data about their module during field testing.

LifeLines project strategies included:
- residential faculty workshops,
- field testing of curriculum modules,
- presentations at professional meetings,
- publications,
- use of web technologies.

LifeLines OnLine Faculty Workshop

Two Year College Faculty
Apply by April 16, 2003

Several hands-on technology-rich curriculum modules for introductory biology
May 30 - June 2, 2002
Southeast Missouri State University

ICBL is a variant of Problem Based Learning. ICBL’s problem-based strategies are aligned with the collaborative, investigative approaches found in the software, tools, resources and 3-P’s philosophy of the BioQUEST Curriculum Consortium.

1) Problem Posing:

ICBL begins by asking groups of students to analyze a case (problem) that describes a realistic problem, (e.g., below left).

Together the students use the Case Analysis sheet (below, right) to identify prior knowledge, key issues and outstanding questions.

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Together the students use the Case Analysis sheet (below, right) to identify prior knowledge, key issues and outstanding questions.

2) Problem Solving:

Students next undertake a scientific investigation using relevant field, laboratory, computational or simulation methodologies. More than other variants of PBL, ICBL strongly encourages learners to initiate their own investigations or to value teacher-designed scientific investigations.

3) Peer Persuasion:

Students present their results in a way that persuades others of the reasonableness of their approaches and findings.
The LifeLines project led to many opportunities beyond the NSF-funded activities. Here are just a few:

1. NSF Chautauqua short course on ICBL, July 11-13, 2004, Memphis TN (Apply now!)
2. PRISM G-K-12 project at Emory Center for Science Education
3. BEDROCK, a bioinformatics national dissemination project at bioquest.org/bedrock
4. STARTING POINT, using ICBL in Geoscience, an NSDL project

Further Dissemination and the Future of ICBL

Some of Our Publications on ICBL:


There are 65 case modules (see partial list below and sample at left) representing biology, chemistry, mathematics, physics and environmental science.

CURRICULUM MODULES/ CASES

WEB SITE http://bioquest.org/lifelines

The site includes:

- 65 Case modules
- Extensive faculty development resources (see menu, right)
- Field testing materials (see right)
- ICBL bibliography
- Contact, participant (see right) and calendar information
- Links to other case-based learning or PBL projects (see right)

FIELD TESTING RESULTS

Data were collected from LifeLines participants and the students taking courses in which the cases were implemented. Typical results are shown, right.

PRODUCTS and RESULTS

A CADRE OF ACTIVE FACULTY

Participants in the three LifeLines NSF summer workshops came from 27 two year colleges in 17 states and two foreign countries (see map below, right).

>90% implemented ICBL in their classes.
>50% presented their work on ICBL at professional meetings or conducted ICBL workshops for colleagues.
>40% have written additional case modules.
5% formally published their cases

These exceptional results are a strong indicator of an effective faculty development model and useful approach to science learning.

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The LifeLines project led to many opportunities beyond the NSF-funded activities. Here are just a few:

1. NSF Chautauqua short course on ICBL, July 11-13, 2004, Memphis TN (Apply now!)
2. ICBL workshops at other colleges, e.g., Denison University Beloit College BioQUEST
3. PRISM G-K-12 project at Emory Center for Science Education
4. BEDROCK, a bioinformatics national dissemination project at bioquest.org/bedrock
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