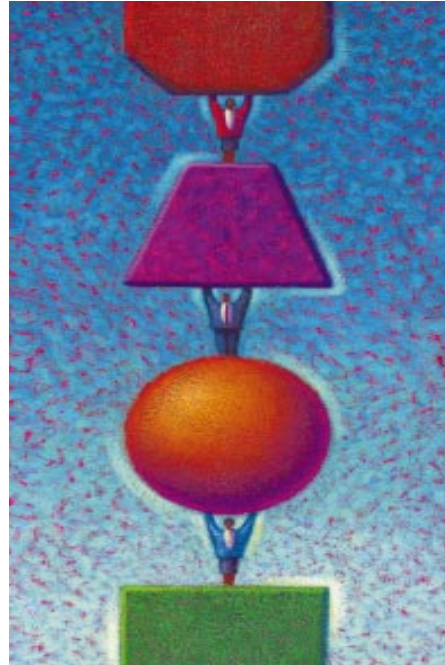


# Workplace Research

Summer 2002



A model for guided research to improve education for engineering and industrial technicians.

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SC ATE Center of Excellence  
*Guidelines for Workplace Research*

## **RATIONALE**

Faculty and administrators must continue to improve the learning environment by better aligning it with workplace needs. The SC ATE Workplace Research Model provides a guide for interdisciplinary faculty teams to conduct workplace research and gain a better understanding of the technician's role in the workplace. Using the Model, faculty verify the workplace skills of the technician and document a comprehensive view of the technician in industry. The Model includes

- administrative guidelines for faculty and industry
- directions for conducting the research, and
- forms for collecting and reporting data.

## **BENEFITS**

By conducting workplace research, faculty members become more enthused and motivated about designing and implementing integrated curricula and are better equipped to make learning relevant to the learner. They learn how problem-based instruction better meets the needs of students entering the technology-driven, constantly changing, workplace of today. The workplace research experience helps faculty become aware of the complexity of the work environment and the need to structure classroom activities that teach students how to accept change.

## **EXPECTATIONS**

All SC ATE Faculty who are, or who anticipate, teaching the SC ATE curricula are invited to conduct workplace research between May 2002 and July 2002.

Research should be conducted in interdisciplinary teams of two or more faculty for the experience to be most meaningful, for reporting to be less burdensome, and for the information to be of greatest value to instructional design.

Each participating team will submit one report per research activity according to established reporting guidelines.

Research will be done in blocks of time at one site, or at a few locations, to allow an in-depth analysis of a single technician's tasks and skill requirements.

## GRANT SUPPORT

Upon receipt of a proposal, the project will provide authorization for reimbursement (up to \$500 per person) to the college for costs associated with providing faculty time to participate in the research activity. Up to 20 hours of substitute pay, contract, or stipend pay (for those employed less than full time) may be requested per person. Actual reimbursement to the college **will follow and be contingent upon receipt of research reporting forms from participating faculty.**

## PROPOSAL PROCEDURES

1. Faculty member works with his/her supervisor and the college's chief instructional officer (CIO) to determine (a) procedures for approaching industry with your request; and (b) people with whom this research should be coordinated to reduce duplication of activities. For example, Tech Prep and School-to-Work coordinators should be consulted to ensure that the technical college is not overburdening certain industries already participating in the school-to-work initiative.
2. Determine number of research hours and method of compensation for each participating member of the faculty team.
3. Develop a list of possible industries to visit (first choices may not be available).
4. Fill out the proposal form and submit it to the CIO for approval signature.
5. Mail the signed proposal to the ATE office in Columbia.
6. Keep your supervisor and CIO informed throughout the research activity.

## RESOURCES

Possible sources of help in identifying industries who employ engineering technicians include:

- (a) Engineering Technology faculty.
- (b) Engineering Technology advisory board members.
- (c) Continuing education, career center, or job placement personnel, and
- (d) representatives for the Center for Accelerated Technology Training (CATT) in your area (formerly "Special Schools").

## ATE INFORMATION PACKETS FOR INDUSTRY PARTNERS

Prior to visiting an industry, information about the college and the workplace research activity should be shared with your host. Contact the SC ATE office for such items as brochures and curriculum materials.

## INDUSTRY VISIT

Go into the industry looking for information that will be used to help the technical colleges/SC ATE Center of Excellence produce engineering technicians to meet the needs of the workforce. Help industry contacts understand how necessary they are to the process.

- Meet with company personnel such as supervisors, trainers, and human resource personnel to review the role of the engineering technician in the company.
- Tour the plant to observe how the role of the engineering technician helps to fulfill the mission of the company.
- Meet with engineering technicians to research information about the tasks they perform and the skills in the areas of mathematics, science, engineering technology, and communications/professionalism necessary to enable them to successfully perform their jobs.
- Use the common reporting forms and skills checklists as much as possible to help collect information. Forms include:

Report Cover Sheet.....page 6  
Company Profile Sheet..... page 7  
Technician Profile Sheet..... page 8-9  
Skills Checklists..... page 10-12  
Faculty Reaction Sheet..... page 13-14

## AFTER THE VISIT

- Use the Team/Individual Reaction Sheet to record your overall reactions and observations of the role of the technician in the company. Complete this sheet as soon as possible after the visit.
- Finish the reporting forms as thoroughly as you feel capable. If you do not feel that you accurately evaluate an area, leave that skill or question blank.
- Forward the completed sheets by July 31, 2002 to:

SC ATE Center of Excellence  
State Board for Technical and Comprehensive Education  
111 Executive Center Drive  
Columbia , SC 29210

Reimbursement to the college will follow and is contingent upon receipt of faculty research reporting forms.

## ATE Workplace Research Proposal

Mail signed Proposal to:  
 SC ATE Center of Excellence  
 SC Technical College System  
 111 Executive Center Drive  
 Columbia, SC 29210

College: \_\_\_\_\_

**Checklist:**

- \_\_\_\_\_ Procedures for contacting industries have been identified and approved by CIO.
- \_\_\_\_\_ Method of faculty compensation has been determined (ATE will reimburse for substitute pay/release time or contract pay up to \$500 per person).
- \_\_\_\_\_ Hours to be devoted to this activity have been determined (a maximum of 20 hours may be used).
- \_\_\_\_\_ Possible industries to visit have been identified.
- \_\_\_\_\_ Faculty understand that all work must be completed before July 31, 2002.
- \_\_\_\_\_ Administration and faculty understand that reimbursement to college will follow and is contingent upon receipt of faculty research reporting forms by the SC ATE office in Columbia.

| Faculty Names | # Hours Requested in this Proposal | # Hours Previously Paid for ATE Workplace Research | Teaching Discipline |
|---------------|------------------------------------|--|---------------------|
|               |                                    |  |                     |
|               |                                    |  |                     |
|               |                                    |  |                     |

Industries under consideration \_\_\_\_\_

\_\_\_\_\_

Approval \_\_\_\_\_ Date \_\_\_\_\_

Chief Instructional Officer

# SC ATE Faculty Workplace Research Report

**College Team**  Technical College

**Team Members Visiting**

|  |
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|  |

Date

## Company Profile Sheet

Company:

Address:

Type of company: (i.e. manufacturing, steel fabrication, etc.)

Employee Total:

Describe any Products Produced:

What types of engineering technicians does your company use?

1

2

3

4

5

How many engineering technicians does your company employ?

Company personnel involved with the visit:

| Name | Position |
|------|----------|
| 1    |          |
| 2    |          |
| 3    |          |
| 4    |          |
| 5    |          |

Please state a recommended company contact person for future communications.

| Name | Position | Phone |
|------|----------|-------|
|      |          |       |
|      |          |       |

May we contact you or your technicians in the future to assist us with curriculum development? (i.e. validating curriculum competencies, designing work-based problems, etc.)

YES  NO

Please attach any information on the company that might be helpful for future networking opportunities.

Technician Profile Sheet

Technician Name:

Job Title/Position:

Years with Company:

Background Information

Education:

Previous Training:(i.e. on-the-job, courses, continuing ed.)

What plans do you have for additional training, including college?

What courses and/or training do you wish you had had before this job?

Job Responsibilities

Technical:

Communication:

Equipment/Laboratory:

Problem Solving / Trouble Shooting:

Technician Profile Sheet

Interview Questions

1.) Has this been a good career choice for you?  YES  NO

Why, or why not?

2.) What changes have taken place in the last five years which have changed your job? (Please comment specifically on the areas listed below as well as any other areas.)

Computer/Equipment:

Professionalism/Communications (oral, reports, etc.):

Teams:

Other:

3.) What suggestions do you have that might help instructors to motivate students, to improve retention in this field, or overall to help students prepare for the 21st century workplace?

General Discussion Notes: (Please use back of sheet if needed.)

## Skills Checklist\*

Competency Level Required 0 = Never do / use 1 = Basic 2 = Intermediate 3 = Expert

### Mathematics

| Skill                                 | 0 | 1 | 2 | 3 | Skill   | 0 | 1 | 2 | 3 |
|---------------------------------------|---|---|---|---|---|---|---|---|---|
| Whole number & integer operations     |   |   |   |   | Organize data into tables, charts, or group     |   |   |   |   |
| Decimal number operations             |   |   |   |   |   |   |   |   |   |
| Percentages                           |   |   |   |   | Mathematical trouble shooting / problem solving |   |   |   |   |
| Estimates                             |   |   |   |   |   |   |   |   |   |
| Fraction operations                   |   |   |   |   | Probability                                     |   |   |   |   |
| Scientific notation                   |   |   |   |   | Exponents                                       |   |   |   |   |
| Engineering notation                  |   |   |   |   | Logarithms                                      |   |   |   |   |
| Ratio & proportions                   |   |   |   |   | Formulas  |   |   |   |   |
| Metrics (SI)                          |   |   |   |   | Geometry  |   |   |   |   |
| English measurement                   |   |   |   |   | Right angle trigonometry                        |   |   |   |   |
| Square roots                          |   |   |   |   | Systems of Equations                            |   |   |   |   |
| Statistics (mean, median, mode, etc.) |   |   |   |   | Linear Equations                                |   |   |   |   |
| Data gathering                        |   |   |   |   | Quadratic Equations                             |   |   |   |   |
| Data analysis                         |   |   |   |   | Calculus  |   |   |   |   |
|                                       |   |   |   |   | Vectors   |   |   |   |   |
|                                       |   |   |   |   |   |   |   |   |   |
|                                       |   |   |   |   |   |   |   |   |   |
|                                       |   |   |   |   |   |   |   |   |   |
|                                       |   |   |   |   |   |   |   |   |   |
|                                       |   |   |   |   |   |   |   |   |   |

### Science

| Skill   | 0 | 1 | 2 | 3 | Skill   | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|---|---|
| Use appropriate physical units & unit conversion      |   |   |   |   | Identify & apply oscillations & wave motions      |   |   |   |   |
| Identify & apply properties of fluids                 |   |   |   |   | Identify & apply optical instruments & properties |   |   |   |   |
| Apply fiber optics                                    |   |   |   |   |   |   |   |   |   |
| Express quantities with correct precision             |   |   |   |   | Draw graphs & calculate slope                     |   |   |   |   |
| Identify & apply mechanical forces motion             |   |   |   |   | Write procedural steps                            |   |   |   |   |
|   |   |   |   |   | Diagram & label equipment                         |   |   |   |   |
| Identify & apply uses of energy concepts (& momentum) |   |   |   |   | Perform simple measurements                       |   |   |   |   |
|   |   |   |   |   | Identify experimental errors                      |   |   |   |   |
| Identify & apply temperature & thermal properties     |   |   |   |   | Keep records of work in notebook                  |   |   |   |   |
| Identify & apply electrical magnetic properties       |   |   |   |   | Apply scientific method                           |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |
| Identify & apply simple circuits AC & DC              |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |

\*Additional skills may be added in blank spaces.







