

A Best Practices Manual for Effective MATE Internships

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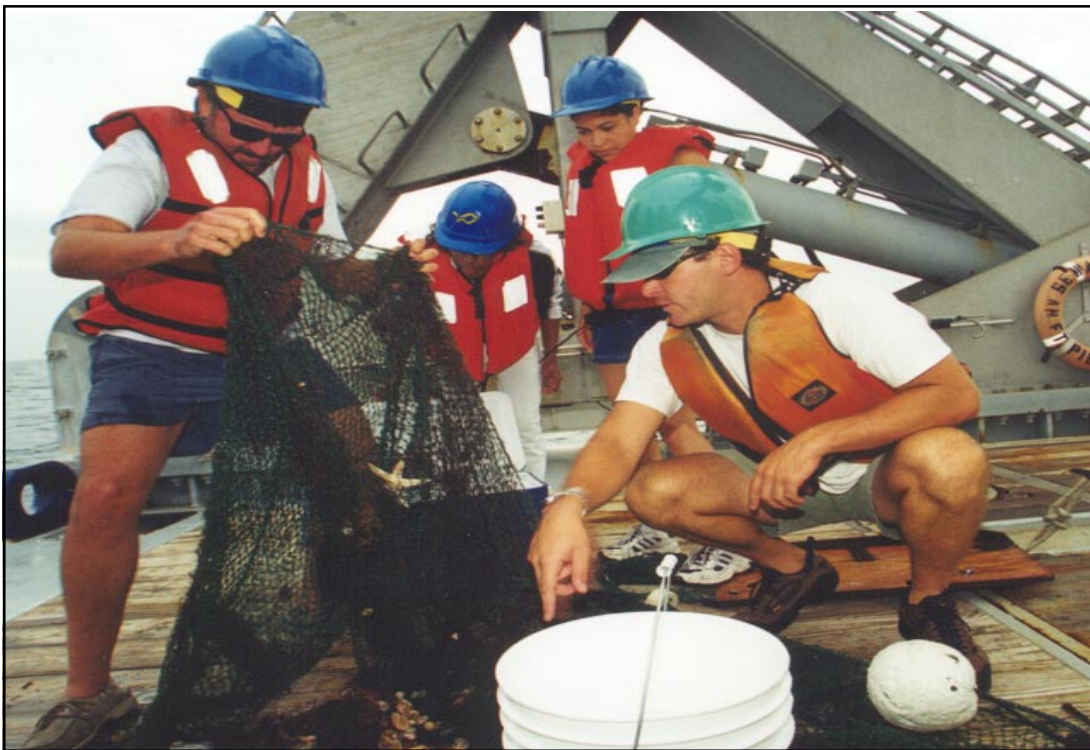
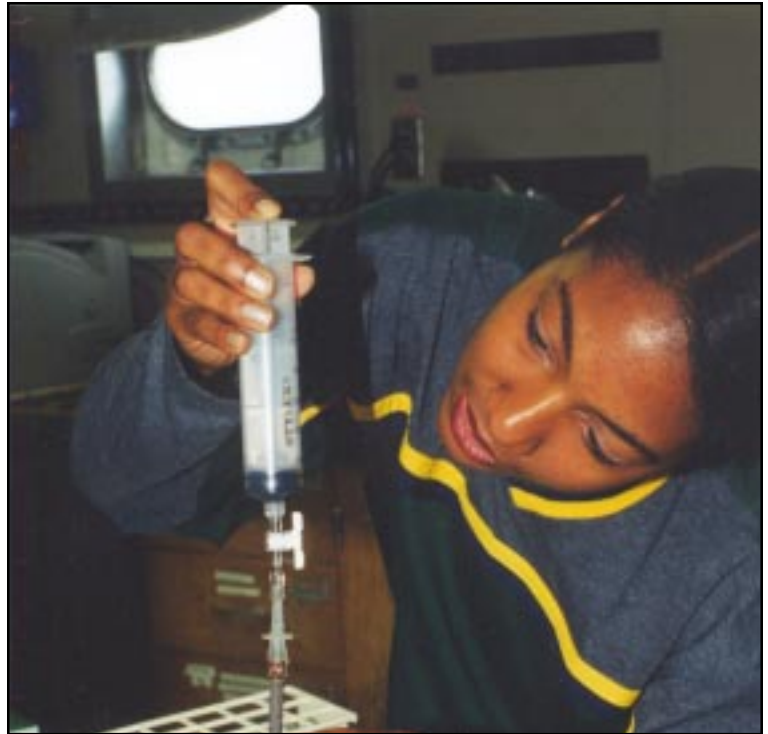


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I n t r o d u c t i o n



Introduction

Providing high quality internship experiences for technically focused community college students is a primary goal of the Marine Advanced Technology Education (MATE) Center and its network of partners. This handbook provides an overview of strategies as well as policies and procedures to help MATE affiliated institutions design and implement effective practical training programs. Much of what follows is drawn from policies and procedures used in the MATE technical internships administered by the MATE Monterey Peninsula College (MPC) partnership as well as more broadly focused internship and work/study programs at Harbor Branch Oceanographic Institution, the author's home institution.

Many internship sites use a one-employer-based model where a single entity (business or college or non profit or government agency) organizes and administers its own internship or work-study programs. However, there are also many successful

multiple-site models such as the MATE-MPC initiative where a university (or a non-profit organization or other entity) recruits students and places them in a variety of workplaces. Because most MATE internships are likely to be multi-employer, this manual focuses primarily on providing information relevant to such programs with less emphasis placed on single-employer models.

Successful Internships at a Glance

Outcomes and Benefits

In a well-designed program, students will

- Master a coherent set of structured technical skills.
- Gain experience with real-world problem-solving.
- Receive constructive feedback on performance.
- Develop good communications skills and reliable work habits.
- Have the opportunity for individualized, independent exploration.
- Validate their accomplishments via an internship transcript.

Objectives

Specific MATE Internship Objectives

A well-conceived plan with specific learning objectives for students should be produced by each MATE affiliated program. As a potential internship program sponsor, it is important that you think about the mixture of elements that your organization (or network of organizations) can offer. All MATE internships should include opportunities to learn and master a coherent set of structured and well-defined technical skills as well as to gain experience with real-world problem solving (i.e. to troubleshoot in controlled but unfamiliar situations). MATE programs should focus on the individual and provide repeated constructive feedback on performance throughout the internship period so that there is an opportunity to improve specific skills and resolve problem areas as the individual progresses. In addition, there needs to be an emphasis on developing good communications skills, professionalism and reliable work-habits (SCANS, 1991). Finally, as the United States moves into the 21st century, it will be increasingly important for technical professionals to be flexible, creative and able to operate autonomously. To encourage these habits of mind, there should be some opportunity for individualized, independent exploration beyond the purely technical aspects of the internship.

The optimal balance between these learning objectives will obviously vary from one organization to another, and from one individual intern to another, but growth in all these skill or competency areas should occur during every MATE internship. To document the process, each MATE program should establish an internship ‘transcript’ for each individual that describes what has been learned and what skill levels have been achieved. Such transcripts should be produced and made available to all interns at the completion of the program.

D E S I G N

MATE Internship Design

Ensuring a successful internship experience takes a significant amount of time and effort. Advance program planning is essential and must take these realities into account. Make sure that there is an individual (or set of individuals) at your college (or in a Personnel Office for an employer-focused program) who can devote enough time to organizing the program and make sure that it runs smoothly. Make sure that program staff and mentors fully understand the time and effort commitment that they are making. Discuss well in advance what your institution hopes to gain from internships. What do mentors at placement sites hope to gain? Is it potential employees? Is it relatively inexpensive technical help? Do prospective mentors have a sense of obligation to serve as role models for the next generation of people in their field?

As you plan, decisions need to be made early on several key elements:

- the optimal length of the internship period
- the number of internships at each participating partner site
- selection of supervisors/mentors
- orientation or training programs for supervisors and students
- administrative procedures (both standard operating procedures and procedures for dealing with problems) and
- evaluation plans for the program.

In successful multiple-site models operated by academic institutions, the number of interns with each employer typically ranges from one to several per work site. At 'single-employer' sites, achieving a critical mass of 4-6 interns at any given time

helps participants learn from each other and identify cross-connections between their particular projects or work assignments. Training and orientation activities can also be done more cost-effectively. Academic and business partnership programs can foster similar interactions and accomplish similar economies of scale by bringing all interns `in from the field` periodically for group orientation, training or program discussion sessions.

At some work sites, internship sponsors may wish to deviate from the standard apprentice-master model of one mentor and one student and use a group or cooperative project approach. In today's world, many projects require more than one skilled individual to complete. Consider grouping 2-3 interns together to work on small-team projects under one supervisor. Decide if experiences will be best done in a small team or with a more traditional one-on-one mentor relationship. For example, at HBOI less experienced younger students often work in a small group setting and direct mentor-student pairing is used for more advanced students.

The **length** of effective internships will vary with the workplace and the project. Internships at academically focused workplaces generally follow the scholastic year and range from 10 weeks (summer programs; academic quarters) to up to 16 weeks (one full semester). In some situations (i.e. the marine policy internships offered by CORE, Consortium for Oceanographic Research and Education), a longer period of 4-6 months may be needed. Programs shorter than 10-12 weeks can work well as long as they are carefully designed and the skills to be learned are relatively uncomplicated.

Full-time or half-time (20 hours per week) internships are easier to manage than situations where interns work in shorter

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blocks one or two days per week. Such part-time work needs to be very carefully planned and scheduled to insure that needed resources and people will be available during intern work-hours and that work time is not too fragmented. For many tasks or projects, 6-8 hour blocks of time on consecutive days are required for effective learning and adequate reflection and follow-through.

Select staff who will serve as **intern supervisors and/or mentors** carefully. Ask each person to prepare an internship proposal or request in a standard format. This plan does not have to be long or complex, but measurable objectives do need to be set and well understood by both intern and mentor. The arrangement has to be beneficial to both the intern and the host. The internship agreement/plan developed by MATE and MPC is available in the Resources section of this manual and is a good starting point.

Read what others have written about effective mentoring and consider their advice as you set up your program. Some good sources are presentations and papers by Yentsch (1998) and Hartwig (1999). The National Academy of Science booklet Adviser, Teacher, Role Model, Friend (NAS, 1997) is a comprehensive, thought-provoking handbook that every mentor should read and keep on his or her desk. The federal Department of Education website (www.ed.gov/pubs) provides easy access to 'Yes, You Can', a mentoring guide with a wealth of information for organizations and individuals including a checklist for mentoring programs.

Talk to each potential mentor. Is each individual genuinely interested in mentoring students or looking for cheap labor? How much experience has each person had? What is the person's schedule for the internship period? Will he or she go on vacation or extensive professional travel? What provisions have been made for the intern's supervision if this happens?

According to Hartwig (1999), key qualities for mentors are the ability to be approachable and responsive to others, a willingness to ‘open doors’, a non-combative personality and high professional and personal standards. Check with at least one colleague or reference about each mentor; do they think that a prospective supervisor will make a good mentor? Personnel office staff can also be helpful. Be sure to keep this information confidential.

One point to consider is that mentors and supervisors do not necessarily have to be the same individual. If a supervisor is very skilled and highly task oriented but reticent and less comfortable with interpersonal contact, someone else in the work group (or the overall program administrator) may be able to add a more personalized touch to the mix.

Every program should provide **orientation or training** for intern supervisors to help them become mentors as well as supervisors. This can be as simple as a one-on-one conversation with each mentor or as formal as a classroom presentation on mentoring followed by a group discussion. Review the goals of your organization’s internships and emphasize the importance of regular, consistent contact between the supervisor and student. Alert staff to the fact that different individuals may have different learning styles. When matching students with mentors, consider the personal styles of each.

Recognize the need to set up some **standard administrative procedures** for the program well in advance. Protocols will be needed for information dissemination, recruitment and selection, student orientation and program evaluation. The Procedures section of this manual offers advice and examples of effective techniques for each of these components; the Resources section contains model documents that can be modified

D e s i g n

for use by your program.

In addition to standardizing the flow of the program, think about what can go wrong. Who will decide if an intern must be asked to leave the program and under what circumstances? Can your Personnel department or the Internship Manager serve as a ‘court of appeal’ or ‘counseling service’ if any problems arise between mentor and student?

Evaluation and follow-up procedures should not be an after-thought. Before the program starts, think about how you will collect data to answer a number of questions. How well did individual students perform? What problems arose? What procedures can be improved? Evaluation can include the completion of written questionnaires by students and supervisors as well as analysis of notes compiled by the program manager during each internship period. Last but not least are annual follow-up activities that track the academic and career progress of interns from previous years.



Successful Procedures and Strategies

This section offers advice on what has worked well for others and refers the reader to sample forms, checklists and evaluation packets that can be modified to fit specific program needs (see Resources section for these materials).

Recruiting

Announcing your Program and Recruiting Students

Keep program descriptions simple and clearly identify what type of student you are seeking, what prior course work or training is required, what skills will be taught and what your organization's goals are. If you are a college interested in affiliating with MATE and establishing a regional intern program, contact the MATE Center (www.marinetech.org; 831-646-3082) for information on becoming a partner, tapping into the MATE internship network and linking your electronic descriptions to the main MATE web site. If you are an employer, look at the MATE web site to identify colleges and other institutions that are providing the academic training needed to be a useful intern at your site and ask such MATE partner colleges to list your intern opportunities. You may also want to send an organizational representative to any career and internship days at nearby community colleges.

P r o c e d u r e s

Application Procedures

In contrast to traditional science-based internship programs (where sites are highly diverse and a variety of program specific procedures are used, we envision that MATE affiliated internship programs will use similar forms and procedures to standardize requirements and maintain high quality. Sample application forms from the MATE-MPC regional program and the MATE-UNOLS program are currently available for partner sites to adapt. These documents are in the Resources section of this manual along with sample forms from more traditional science-based internship sites (i.e. HBOI).

If electronic resources permit, we encourage partners to place at least part of the application packet ‘on-line’. There are at least two ways to do this. Sites with sophisticated web site support can make the entire process electronic with students filling out and submitting completed forms on-line. A less sophisticated route is to place a Word document on line and ask that students download it, fill it out and mail it in. To ensure confidentiality, letters of recommendation and transcripts may be mailed separately to the internship office by referees and registrars. To reduce the time spent matching application forms with letters and transcripts, some internship offices may elect to ask students to submit a complete application package (with a printed or downloaded application form, sealed reference letters and an official college transcript) via mail or courier service. This type of ‘packaged submission’ has been used for years by organizations such as ORISE (Oak Ridge Institute for Science Education) that handle applications for national fellowship and internship programs (such as the NSF Graduate Fellowship Program).

All forms and program descriptions must clearly describe any minimum eligibility requirements (over 18 years of age; U.S.

Procedure

citizen; appropriate visa status for foreigners; currently enrolled student in good academic standing). The program announcement should describe the work environment, pay and fringe benefits (if any), if travel reimbursement and housing are provided and so on.

Many students who inquire about marine science internship opportunities are looking for broad, highly charismatic experiences such as ‘saving the oceans’ or ‘swimming with dolphins’. Although MATE-related programs are likely to receive fewer such applications because of their more technical focus, internship coordinators or managers should keep in mind that one of their responsibilities is to help students focus on more realistic and marketable career paths. Students should be advised to be as specific and concrete as possible in their applications and explicitly describe the interests and skills that they bring to the table in any internship application that they submit. A written resource that can help students focus is Cook et al. (1998), a paperback published by the Environmental Careers Organization with a student-focused chapter on ‘Volunteer Programs and Internships’. ECO also maintains a helpful website (www.eco.org).

In evaluating candidates, many programs ‘triage’ applications by dividing them into categories: for example, students who fall above an agreed upon Grade Point Average (GPA), those well below and borderline cases. After a staff review of borderline cases to identify students whose letters or other statements suggest that GPA may not be a good measure of success, a pool of qualified applicants is established. Staff then review applications in detail and begin to identify those students whose course work and interests best fit the needs of each internship opening. The specific criteria used should vary with the type of program. As an example, at HBOI, we use a threshold GPA of 2.75 as the cut-off point for a program for college freshmen and sophomores and 3.0 for older students. After we determine which applicants are worthy of further review, we no longer use the GPA as a ranking criterion, but look instead at the

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quality of reference letters and the match between student and supervisor interests and background. The ability to write clearly is also very important to us.

If time and money allow, it is a good idea to ask each prospective mentor to talk to the top two candidates for the position over the telephone. Before making final selections, it is also an excellent idea for the program manager (or the mentor) to talk to the top candidates' advisor(s). The marine policy internship program sponsored by CORE in Washington, D.C. requires a face to face interview.

Successful Internships at a Glance

Essential Elements that are Often Overlooked

- **Organizations** must make a significant investment of time and effort.
- **Mentors and interns** must both take responsibility for learning and be willing to engage in a continuing dialogue.
- Workplans must set measurable objectives for students and focus on realistic and marketable skills and career paths.
- Thoughtful **evaluation** procedures are vital for programs to improve and must be planned ahead of time; assessment should NOT be an afterthought.

Requirements

Pay and Other Legal Concerns and Requirements

Stipend levels range from just above minimum wage (about \$220 per week) to over \$600 per week in industry. Many academic institutions and marine research organizations provide relatively low cost housing for interns on site. Most colleges offer low-cost health coverage for their student. Talk to your Human Resources or Personnel Office about how work-related state and federal laws apply to interns working within your organization or affiliated with your college.

As an example of how one organization is affected by these rules, at HBOI both paid and volunteer interns are covered by the organization's Worker's Compensation Insurance with the organization covering premiums. Everyone is required to pass a pre-work drug screening. Paid interns are considered temporary employees with FICA and federal withholding taxes deducted from salaries. They also qualify for holiday pay but are not eligible for other fringe benefits. We encourage all interns to make sure that they are covered by medical insurance through their home college or their parent's policies.

To improve workforce diversity, special attention is needed to reach potential students and interns from underrepresented minority groups. Personal contacts with community leaders (as well as college and school district staff who work with minority students) are absolutely necessary. With today's busy schedules, simply mailing out program information simply does not work. Again, to provide a specific procedural example, the Education Office at Harbor Branch maintains a database of minority faculty contacts for program mailings. We also send e-mail messages to key individuals when the program is announced and follow-up with phone calls a week or two before the program closing dates.

Requirements

A web site (www.savstate.edu/scitech/MarineSci/) aimed at African American students interested in the marine sciences has been established by Savannah State University. This site provides on-line access to the Ocean Connection newsletter and to an extensive list of links including a variety of internship listings. NAFEO (the National Association for Equal Opportunity in Higher Education) maintains a web site (www.nafeo.org) with a primary focus on HBCUs (Historically Black Colleges and Universities) as well as African American educational issues. The site also lists members of a variety of other consortial groups (including Hispanic Serving Institutions and Tribal Colleges and Universities). Another resource is MOLIS, the federal Minority on-line information service (www.fie.com/web/mol/). MOLIS allows students to search for specific programs and federal grant and scholarship opportunities for minorities. The website of SACNAS (Society for the Advancement of Chicanos and Native Americans in Science) is focused on the interests of Hispanic and Native American graduate students and working professionals in the sciences (www.SACNAS.org) but provides an extensive listing of internship and other programs for undergraduate students compiled by SACNAS board member Dr. John Cortinas at the University of Oklahoma and NOAA's National Severe Storms Laboratory. SACNAS also offers programs and workshops for K-12 educators.

Special efforts may also be needed to draw more women into non-traditional technical specialties. A valuable set of workbooks and bibliographic resources for employers and community college faculty has been produced by the National Institute for Women in Trades, Technology and Science (IWITTS; Milgram, 1997; see www.serve.com.iwitts). IWITTS also distributes a video [Futures: Preparing young women for high skilled, high wage careers](#). The National Science Foundation has compiled a CD-ROM on its programs and resources for women and girls and also maintains a page on the web (www.nsf.gov/ehr/hrd/ge/).

Experience

Managing the ‘on-site’ experience

Once one or more interns have arrived, keep in mind the old saying: ‘God (...or the Devil) is in the details’. The ideal situation is to have an organized program manager who proactively tracks all aspects of the program and anticipates problems before they occur.

Student orientation activities can vary in complexity and level of detail to fit the needs of the employing organization. At a minimum, incoming interns should learn about the organization’s overall mission, be introduced to key organizational rules and policies and find out where to go for more information. Employment paperwork (such as Federal I-9 and W-2 forms) must be completed. Key workforce safety rules and behavioral mandates (i.e. drug-free workplace requirements) need to be reviewed. To make sure that there is no confusion, many organizations require that incoming interns sign a statement saying agreeing to abide by organizational rules and policy.

In addition to standard government and organizational forms, many technical employers have policies on intellectual property that need to be reviewed. For example, at HBOI, all paid employees and volunteers must read and sign a form indicating that they understand that any discoveries made or inventions devised as part of any work at HBOI are the property of the organization and are not to be divulged or distributed outside of the organization without permission from management.

Orientation can be done in a group or on an individual basis and handled by the program manager and/or Human Resources staff. Ideally, either type of orientation will be followed by an informal ‘people focused’ activity. If orientation is a group activity, it could end with a group tour and/or welcome reception

of some sort where the incoming interns can talk informally with supervisors and other interns. If orientation is done on an individual basis, the supervisor could be asked to do an informal walk-through with the intern so that the new person gets a feel for the workplace and can be welcomed by key staff members and coworkers.

It is important that incoming interns recognize that they are ultimately responsible for their own learning and need to be proactive about fulfilling personal objectives during the internship period. Hartwig 's (1999) short article provides some excellent advice and should be recommended reading for incoming interns. Each individual seeking to be mentored needs to think carefully about his or her strengths and weaknesses, define for him or herself what they are seeking in respect to their own career and development and be willing to put forward the 'necessary and consistent effort to be mentored'.

It is vital that each supervisor and student draw up a project plan of work, agree upon goals for the internship and establish a schedule of regular contact and performance evaluation. Although effective programs may vary in the degree of formality and standardization of requirements, all must set performance standards and require periodic oral or written reports to monitor progress. It is essential that there be periodic checks and final closure on what has been accomplished or learned.

Documents and procedures developed by the MATE-MPC program provide an excellent starting point and framework for this planning process. Student responses from the 'Skills and Interests' section of the MATE application form can be readily matched with information from the 'Skills Needed' section of the Employer Internship Description form.

Benchmarks and periodic reviews need to be used as needed

Experience

to keep the plan on track. The protocols used by Prince William Sound Community College are a good example of how a technical program at a community college can handle ongoing assessment. At PWSCC intern time sheets are verified and submitted after each 50 hours of training along with task papers that outline activities and detail items that each student has learned. A Proficiency Checklist is also completed over the course of the internship to determine progress and document attainment of goals.

A typical tracking procedure at a research organization like HBOI would consist of a weekly meeting between intern and supervisor, biweekly timesheets, and a final oral presentation and written report describing what has been learned or accomplished. In such settings, it is a common requirement that interns maintain daily logbooks. Some supervisors/mentors work with interns intensively at the beginning and near the end of a project and give students more independence in between (bearing in mind the requirements of the project and the skill levels of the students).

Keep in mind that all effective internships maintain a good balance between acquiring technical skills and developing student abilities to work independently and think critically. Paul (1993) defines critical thinking as acquiring in-depth learning skills and provides an overview of how educators and mentors can help students recognize what is involved in applying concepts and skills to new situations. More information and advice on this topic is available at www.criticalthinking.org.

All sites should have a stated policy that discourages using interns primarily for routine tasks (lab dishwashing, filing, etc.). The MATE Internship program and other program guidelines (i.e. for HBOI's research internships) state that interns can be asked to do such tasks if they are related to the intern's project or skill acquisition plan but that such activities should be

E x p e r i e n c e

a minor part of the overall picture.

To help interns develop good communications skills, a growing number of sites offer informal advice and formal programs on how to communicate effectively. Some of the topics that might be addressed in a half-day workshop on communication skills are ‘how to use audiovisual techniques including Power Point, how to organize your talk, how to set the level of your talk to suit your audience and how to prepare a written paper’. It is also a good idea to organize social events to encourage interns to interact with a wide variety of staff and students in other programs.

E v a l u a t i o n

Individual and Program Evaluation Procedures

The MATE Center has developed a comprehensive evaluation packet that is well suited to multiple-site models (see Resources section). At the end of the program, students are asked to complete two standardized forms: an evaluation of the internship as a learning experience and a skills development assessment form. They are also required to provide a copy of a required daily journal of activities and tasks and an overview of the internship that includes a statement of whether or not all assigned tasks were completed and an assessment of the value of the overall experience. Similar forms for supervisors to complete are provided.

Also included in Resources are sample forms used by sites with a more traditional science focus. A helpful model for evaluation of this type of program is the HBOI form adapted from a self-assessment developed for NSF REU (Research Experiences for Undergraduates) programs by Clarice Yentsch (1997). The questionnaire asks students to rate themselves on skills and problem-solving abilities at the start and end of the program and to answer open-ended questions about the program.

At student-mentor meetings, students can be asked to do quick periodic self-assessments to help mentors monitor progress. For example, Dr. Russell Cuhel (1998) asks his students to identify 3-4 specific skill and content areas where they would like to make progress and give themselves an initial simple numerical rating of where they stand on a scale of 1 to 3. As the internship progresses, this exercise is repeated and Cuhel notes whether the intern has improved, stayed the same or lost round. Areas to be self-monitored can stay the same during the internship or can change if both

intern and mentor agree.

In addition to student evaluations of the program and themselves, evaluation protocols should include a form for mentors to assess the overall program as well as the progress that they think each intern has made. If time permits, intern programs should also do a personal follow-up over the telephone or as part of a post-program group meeting.

Student Tracking

An important but often neglected responsibility is the need to follow-up and keep track of the progress of former interns as they hopefully move into relevant and economically viable careers. At a minimum, intern mentors should be willing to write letters of recommendation and provide continued career advice. Ideally, the organization should have a procedure for sending periodic letters to graduates asking for an update on their activities and current education and career status. The intern manager or personnel department should make an extra effort to insure that this tracking is done. It is all too easy for such tasks to fall through the cracks of a busy office.

Resources

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Sample Materials

MATE Center-MPC package:

MATE Center internship application form

Information for employers in letter format; FAQ sheet for employers

Employer internship description form

Internship agreement form

Internship workplan (blank form and sample form for UNOLS program at Moss Landing Labs)

Internship evaluation packages

Student package

Evaluation requirements letter to students

UNOLS Internship Evaluation Summary form

Marine Technician Skill Evaluation form, self assessment

Mentor package

Sample letter to mentor

Evaluation of program and intern performance form

Marine Technician Skill Evaluation form, supervisor assessment

HBOI Materials:

Intern application form (electronic format)

HBOI REU/Internship evaluation form (non-electronic format)

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W e b s i t e s

Websites

www.ed.gov/pubs Yes You Can, student mentoring manual.

www.rileyguide.com Information for employers on recruiting and managing internships.

www.eco.org. Information for student on internships.

www.savstate.edu/scitech/MarineSci/ Information on marine science programs at a historically minority college with a long history of success; links to other programs.

www.nafeo.org Access to lists of minority institutions of various types.

www.fie.com/web/mol/ Searchable database of colleges and scholarship funding sources.

www.SACNAS.org Similar access point for Hispanic and Native American students.

www.serve.com.iwitts Website for National IWITTS resources for improving gender equity and diversity in technical trades and professions.

www.her.nsf.gov/her/hrd/ge NSF's Gender Equity web page.

www.criticalthinking.org Webpage on strategies to foster higher-level critical thinking by students and faculty.