M-S AMC Policy/Procedure Recommendation for Professional Development of Adjunct Manufacturing Technology Faculty

Document Summary

What it does: This document analyzes the present and preferred state of the adjunct faculty work environment, evaluation and compensation procedures, organizational role, and the allocation of funding to adjuncts in the community college environment. The document includes recommendations for improvement in all of these areas to the end that adjunct faculty are afforded the same professional development opportunities as full-time and tenured faculty, and are encouraged to take advantage of them to maintain a strong skill base.

Who it's for: College administration

M-S AMC Present and Preferred State:

PRESENT STATE → PREFERRED STATE ("New Model")

- Lecturer / Subject Matter Expert (SME)
- Designed for school application

- SME / Mentor / Learning Process Expert
- Equivalent to current Industry Technology

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Purpose

One of the items studied by the Multi-State Advanced Manufacturing Consortium (MS-AMC) Grant is the question of how can a Community College achieve and maintain a manufacturing technology faculty that meets the standards of accreditation bodies as well as technical proficiency in state of the art manufacturing technology. The community college faculty consists of full time, and adjunct instructors as well as lab assistants and other staff. Each group presents different challenges and opportunities in developing and maintaining their skills. Additionally the colleges must address educating this group for delivering a competency-based model of education. This procedure will address survey results and recommendations for improving the professional development of Adjunct faculty.

The Adjunct Faculty Work Environment

First we would consider the conditions surrounding the employment of adjunct (Part time) manufacturing technology faculty.

Adjunct manufacturing technology instructors represent a very specialized faculty that come to the community/technical college through a wide range of technical as well as work experience backgrounds. Their knowledge and experience is constantly impacted by the speed of change in technology and its applications in a dynamic industrial workplace. Few instructors are able to limit their course responsibilities to one course; they must service multiple courses at multiple levels for a range of industrial customers in the college service area.

Instructor schedules must be structured around registration, semester schedules, semester breaks for holidays. Part time faculty often are balancing other employment and family obligations leaving very little additional time for scheduling technical professional development. Further, most colleges do not underwrite the expense of travel and course expenses for adjunct faculty.

The requirements of institutional accreditation and training in student needs, curriculum development, team/collaboration and current equipment technologies make it very difficult to find qualified adjunct faculty.

There is several possible “work- arounds” to this dilemma.

One is to try to involve as many potential adjuncts in factory provided on site instruction when new equipment is delivered and record their certification in some form with Human Resources or Department Chair.

Second, is to involve potential adjuncts in auditing courses where they are encouraged to complete knowledge and skills assessments. These efforts would be completed ahead of future semester needs, again with certifications being recorded and maintained as a “pool” resource by Human Resources or the Department Chair.

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A third avenue of economically enhancing the qualified adjunct pool would be to establish adjunct mentoring where full time faculty would mentor "train" adjunct personnel over an extended period insuring through check lists of objectives, knowledge and skill assessments that an individual is ready to teach a course.

Organizational Structure

Many institution do not embrace a responsibility is to develop and maintain an adjunct faculty that is capable of instructing and certifying students in course materials that go hand in hand with industry's requirements. The belief stems from the concept that the credentials of adjuncts are their responsibility and should not be of expense to the institution.

Based on the survey results of consortium institutions, it was found that the most colleges fall into two broad groups.

One group has a high ratio of Adjuncts to full time instructors. This comes as a result of high course demand that varies and the economics of insurance for additional instructors who specialize in a few technical courses.

A second group of colleges have fewer course loads that can be handled by fewer full time employees and therefore lower associated costs.

These two circumstances result in the dilemma of finding highly specialized instructors who have the time available to serve in an adjunct role.

The Faculty Skills Base

It is easy to understand that aggressive management of the technical faculty's professional development and currency is critical to instructors and all stakeholders. This work can best be done with the use of a professional development database that includes potential adjunct faculty (see example) and implemented throughout all levels of the institution and industrial committees.

To achieve an effective professional development system, a college must embrace the use of systems that encourages an ongoing dialogue between itself and industry advisory committees. It would have a mission statement that directs the tracking of the status of competencies and credentials that industry and the institution expects in its instructors. Additionally, as a college works with its industry advisors one might measure the number of new technologies implemented, the number of faculty achieving industry needed certifications and the number of competencies/certifications included in the curriculum.

As a further measure of a close Industry/College relationship, one might consider the number of times industry trainers are included into on campus classroom hours and the number of instructor visits and time the instructors spend at industry locations learning of activities and needs there. This strengthens industry partnerships, enhances approval of competencies/objectives, and further refines

the knowledge of student career pathways. Some industrial partners actually invite college instructors to attend their factory training classes.

Professional development could play a significant role in technical competence. The survey points out that a mentoring program is typically focused on acclimatizing the new employee to local customs such as syllabus formats, and local learning management system procedures etc. Although this is a good and necessary process, it often doesn't apply to instructor cross training and broadening of the manufacturing technology skills. Succession planning doesn't appear to be significant part of professional development. One idea that would benefit institutional succession planning as well as mentoring of faculty would be to actually schedule faculty in the auditing of one another's courses. Recording these "audits" would provide management with an awareness of the depth of cross training and readiness of an instructor to teach other courses.

Ensuring that relevant skills are retained in an institution by full-time technical faculty could be accomplished developing mentoring relationships between faculty members and reviewed by their supervisor. The development of mentoring relationships requires time. The amount of time needed will vary depending on the faculty member and the particular kind and area(s) of need. However, there should be regular formal mentoring meetings to enable progress.

The mentor should possess adequate expertise in the technical discipline, and the willingness to devote time and energy to the mentee above and beyond their normal faculty responsibilities. The relationship should be one of mutual respect, honesty, confidence and acceptance with the goal of advancing the professional growth of the subject faculty member.

Some of the benefits of investing in mentoring are; the ability to recruit potentially outstanding faculty members, by investing in mentees, mentors stay on top of what is happening in their field, making contacts for mentees will strengthen the mentee and mentors professional networks, mentors extend their academic contribution beyond the classroom, and the result is another outstanding colleague that possesses the skills and abilities to prepare students for various industry occupations.

In a similar fashion, professional competence should be maintained on all equipment associated with curriculum. Often as people retire or leave, their skills leave with them or are at least degraded as someone barely trained is asked to pick up the slack without the benefit of additional training. Professional development is "investment in our people", investment in our course quality and in service to our industrial customers.

Instructor/Course Evaluation

The instructor/course evaluation is an important element in the process of assessing the overall effectiveness of the institution. The effectiveness of the institution is based on the contribution that each of the institution's programs and services makes toward achieving the goals of the institution as a whole.

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The instructor/course evaluations will serve as measuring tools in assessing the effectiveness of faculty professional development, by assessing the performance of the instructor and the relevancy of the course material being taught. The result of the evaluation information can be used by the institution to improve programs and services and to inform resource allocation decisions. Therefore, it is recommended that instructor /course evaluations that will capture feedback from present and graduate students, as well as industry, be developed and implemented at each institution. An outcome of these evaluations should be individualized professional development plans overall institutional professional development database. A second outcome would be the need to teach the instructor to broker additional kernels of knowledge into curriculum with augments such as videos and internet sites.

Curriculum Review

Most of the MS-AMC schools have curricular assessments through advisory boards and industry partnerships. Advisory committees are made up of faculty members and industry partners from local businesses that have an interest in developing employment pipelines from local community colleges to their business. The survey suggests that these committees and other interfaces with industry could be strengthened with a greater competency focus and time spent by all parties at one another's locations working through the details of competency delivery.

Management of Funds

In a Competency Based Education Model, it is imperative for the representatives of industry and the Deans of Technology to develop; maintain and utilize a data base of instructor capabilities. This tool is critical to funding, scheduling and implementing the professional development courses needed to insure that industry and institutional needs are met and that limited funds are targeted and well spent.

Often, it is the responsibility of the instructor to request specific training for updates on software, equipment, etc., (including seminars, conferences). Visits to local business and industry are often approved in order to stay abreast of current industry trends. Traditionally, grant funding is used to fulfill these professional development requests.

It is a good practice to include faculty training in the request for new equipment. As people leave, that training is lost and not replaced. Depending on other instructors to volunteer or request such training often misses the mark of maintaining a qualified instructor base. This issue must be managed aggressively.

Finding funds to pay for full time manufacturing faculty professional development is an area where colleges have the most trouble. In light of the significance of manufacturing to the future of our nation's economy, it is recommended that colleges prioritize funding to ensure that funds are built into

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the department budgets for annual Professional Development and training in the respective areas of expertise.

While many colleges have Perkins grant funds available for Professional Development for manufacturing faculty, information regarding how to access these funds could be made more readily available to manufacturing faculty members with clear channels of who and where to go to obtain the information. It is recommended that Perkins funds could be accessed for faculty Professional Development and training when department funds have been exhausted or are otherwise unavailable.

The above stipulation seeks to ensure that the majority of Perkins funds can then be used to purchase equipment for the manufacturing programs, so that students are training on manufacturing equipment that is current and relevant to industry needs.

Industry has a right to expect that instructors are current in their skill sets and equally responsible to communicate those needs to the college through advisory teams. Often Budgets are limited and Industry scholarships might be considered for sending instructors to special schools. Quality vendor seminars/training sessions requested by a consortium of colleges might aid in the funding and costs of professional development in the industrial skills.

All department budgets provide funding for full time faculty development and the Colleges strongly encourage professional development. Faculty must seek dean approval to attend any off-campus professional development; internal professional development courses are available online and in the classroom and do not require dean approval.

Management of Time

Time constraints are additional issues that must be included in professional development. Time away from class, registration, vacation and holiday schedules create difficulty in planning and scheduling professional development. Regardless, aggressive procedures need to be in place to insure that faculty is prepared to deliver the best and most current education to the students that industry so dearly needs.

Some college departments require that certain Professional Development coursework be taken at specified times.

Current Equipment and Technologies used in the Classroom

Most colleges have remained on the leading edge in the use of technology to teach in the classroom. Training simulators for all facets of industrial maintenance and mechatronic as well as support test equipment and tools are used. It is critical that faculty be trained, and stay abreast of the latest in industry as well as classroom instructional technologies.

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Sometimes training is included in the purchase of the equipment, and is often done Peer-to-peer or through mentors. Some colleges host an event such as Brown bag Wednesdays with Instructional Support.

Recommendations and Action Plan

The results of a study in continuous process improvement by the Multi-State Advanced Manufacturing Consortium (MS-AMC) suggests possible solutions to problems institutions face concerning maintaining a full time faculty that meets the standards of accreditation bodies as well as equipping students for manufacturing careers in a rapidly changing technological environment.

Full-time technical faculty is a very specialized instructional component of every institution. Institutions have the responsibility of keeping full-time technical faculty current in delivering instruction and certifying students to meet industry's requirements.

As with any action plan, there are many metrics one might use to measure and enable progress. **Metrics** based on the recommendations below should be developed and used on a college by college basis in accordance with the needs and goals of the institution.

Revise the Organizational Structure

Based on the study of consortium institutions, it was found that the management of professional development of full-time technical faculty occurs in a range of organizational structures and levels. These findings point dramatically to the need for a management structure that addresses this issue.

1. Place a formalized tasking at a senior level of Academic Affairs for the maintenance and ongoing development of Faculty Skills.
2. Develop a curriculum review process consisting of advisory boards and industry partnerships. Advisory committees are made up of faculty members and industry partners from local industry that have an interest in developing employment pipelines from local institutions to their industry. Through regular meetings with industry advisory boards community colleges will accomplish the following.

A. Continue to strengthen communication between the colleges and industry
B. Improve the relevancy of curriculum content **(# of Advisory recommendations implemented)**
C. Improve teaching and learning processes
D. Enhance the connection between colleges and employment opportunities for graduates

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E. Produce certified entry level workers
F. Improve accountability to ensure that curriculum content remains relevant

Improve the Management of the Skills Base

Develop a professional development database (see example) at each institution that captures the competencies and credentials that industry requires and compares it with skills onboard.

1. Existing technologies being delivered
2. Faculty certifications needed to deliver existing technologies **(# of stakeholder defined credentials required)**
3. New technologies needing implementation **(New Technologies installed)**
4. Faculty needing industry certifications to deliver new technologies **(# of New Competencies required)**

Develop a faculty/course evaluation procedure as a metric to assess the effectiveness of faculty, and the relevancy of course materials. The result of the evaluation information can be used by the institution to improve programs and services and to inform resource allocation decisions.

1. Implement a feedback mechanism on faculty delivery and course content from current and graduate students as well as industry.
2. Provide regular faculty industry visits
3. Allow industry access to the institutions' classroom/lab **(# of industrial trainers and mentors participating in college programs)**

Improve the Management of Professional Development Funds

Develop a structured mentoring program utilizing credentialed faculty and industry partnerships to reduce costs and improve the connection of the institution and industry.

1. New hire orientation and development
2. Skills attainment for existing faculty
3. Encourage equipment resellers to provide free training along with purchases
4. Academic management should make professional development a financial priority
5. Include faculty training in grants
6. Include faculty training in Request for Purchase of equipment
7. Institutions prioritize funding for professional development in department budgets
8. Utilize Perkins funds
9. Industry provide training scholarships to individual and consortiums, share vendor training and provide in plant faculty OJT **(# of Industry sponsored training sessions conducted for instructors)**

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Improve the Management of Faculty Training Time

Develop a process to manage professional development opportunities for technical faculty.

1. Faculty responsibility to request specific training
2. Routine faculty visits to industry
3. Manage faculty release time for professional development
4. Video Record Professional Development opportunities
5. Create an online repository of professional development video recordings.
6. Pursue opportunities for Adjunct instructors to provide coverage while a full time faculty member is away for training.
7. Train the faculty in competency based education model.

Develop a plan to incorporate leading-edge technology in the classroom and lab through purchase of equipment and training in its use.

1. Computer software simulation
2. Training equipment simulators
3. Smart classroom technology
4. Learning Management System

Professional Development for Competency Based Education

Professional development more specific to the Competency Based Educational Model should include a thorough understanding of the Manufacturing Education Institute (MEI) documents which explain the methodology of developing and implementing competency based education in the community college technology programs. (See Deliverables to M-SAMC Grant)

Competency based education implementations using the AMTEC Trainer should also use the trainer specific MEI, (a three day intensive course) which teaches the instructor the details of trainer use in the curriculum. (See Deliverables to M-SAMC Grant)

Other materials from the Grant deliverables that will benefit in Professional Development of all stakeholders are,

1. Bridge to Employment
2. Bridge to Career
3. Bridge to AAS Degree
4. Career Pathway Maps
5. The Continuous Improvement infra-structure model
6. Participant Engagement Facilitator Methods of Student Support
7. Student Completion Toolkit

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8. Use of Workforce Intelligence Models (by CREC)

In addition courses available from industrial vendors will contribute greatly to the effectiveness of competency based education in the AMTEC environment are,

9. Allen Bradley Studio 5000 PLC programming
10. Fanuc Robot Certification
11. Siemens S7-1200 PLC programming (possibly)
12. Arc Flash safety

Just as competency based education requires hands on demonstration of knowledge, skills and abilities by the student, faculty members and other teaching professionals should be reoriented toward demonstrated CBE mastery, and the application of knowledge and skills conducive to producing students that have a more thorough understanding of the knowledge and skills that are needed to succeed in work and in life.

In the CBE environment professional development for technical faculty is no longer an option for colleges; it is a critical component in ensuring the relevancy of college manufacturing programs in tooling the workforce for local industry partners.

The manufacturing CBE environment is successful and productive when education and industry work in partnership to develop curriculum material. As these partnerships grow they can be strengthened by a greater investment of time resources by industry into the professional development of college faculty and equipment. Thus ensuring industry certifications are maintained and relevant knowledge, skills and abilities are being taught.

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