Recommended Procedures for Manufacturing Education Advisory Committees

Amid the changing landscape of workforce education the ties between industry and educational institutions by necessity are becoming more intertwined. College curriculums are being redesigned to encompass theory while at the same time aligning with the training needs of local industry.

With this in mind, college programs that have advisory committees in place or are considering establishing one, have more things to consider. In addition to determining why an advisory committee is needed and what they want it to do; colleges must also be prepared to educate advisory committee members on the concepts and practical application of Competency Based Education (CBE) and on the process of developing Performance Based Objectives (PBO'S). This instruction can be accomplished through employing the Manufacturing Education Institute (MEI).

Advisory committees are generally comprised of knowledgeable, prominent and credible members in their field of expertise from within and outside of the college community. However, it is likely that many have little to no knowledge of what it means to develop curricula that align workforce skills with industry-recognized standards. Because of this, tasking members in the areas of developing PBO's, workforce, and curriculum development will require consistent information and guidance.

Similar to the process of developing PBO's the tasks that need to be accomplished by the advisory committee, should to be clearly defined and understood by all members of the committee. The goal or purpose of the tasks should be communicated to committee members so that they understand, and can articulate what the end result should be.

This type of guidance gives members of the committee an opportunity to leverage their expertise. Members may present ideas about additional tasks that are needed to accomplish the goal or devise a more efficient ordering of the stated tasks, based on the defined goal.

Community Technical Colleges are experiencing the need to redesign curriculum instruction in keeping with advancing technology changes in the manufacturing environment. Increasingly these needs are being expressed as skill and knowledge elements needed for employment in the workplace.

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Implicit in this consideration, is the task of thoroughly examining our present capability of delivering the needed education (Present State) and our desired future capability (Preferred State). By analyzing this "Gap" in the ability to serve the need we arrive at an awareness of steps needed to be taken to continuously improve the curriculum.

Colleges have classically depended on the "Advisory Committee" to provide guidance to curriculum development in a rather general, oversight method of involvement. In the past, it was what a student knew from their instruction that would determine if they were hired by a company. Increasingly, the issue has become "What can you do with what you know?"

In this way, Performance Based Objectives (PBOs) have become the way that skills and knowledge are quantified and identified by modern industries and colleges. These PBOs are more, fine grained and specific to the competencies required in the workplace.

It is therefore of primary importance that a new level of interaction be required among industry, colleges and advisory committees to produce the instructional result needed by employable graduates. In this way collaborative "Gap Analysis" is a method for guiding this interaction.

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To improve the interaction of those specifying technical curriculum, the "Multi-State Advanced Manufacturing Consortium (M-S AMC) has developed an instruction program to increase the skills and abilities of all the stakeholders in advanced technical education. This instructional program is called the "Manufacturing Education Institute" (MEI) and is designed to enable these stakeholders to de-construct and reconstruct courses to deliver course competencies made up of PBOs. These PBOs focus on the tasks that must be done in the workplace by defining the skills and knowledge elements involved. These PBOs are structured to be demonstrable as a certifiable method of proving competency.

It is the purpose of this document to encourage stakeholders to become knowledgeable in the concept and capable in the use of PBOs as a means of improving curriculum.

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Four attachments are included that might be of some guidance to advisory committees and others seeking to incorporate competency based education.

1. "Department Chair's Guide to Developing an Integrated Systems Project Based Curriculum" – A guide to developing PBOs
2. "(NAME OF COMMITTEE) Advisory Committee Meeting Minutes" – A guide to conducting advisory committee meetings
3. "Advisory Committee Member Evaluation" – A guide to evaluating advisory committee meetings
4. "Sample Advisory Committee Meeting Agenda" – A sample advisory committee meeting agenda to use as a guideline

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Department Chair's Guide to Developing an Integrated Systems Project Based Curriculum

Industry Needed Competencies

A department chair must consider and balance many details in determining competencies that are specified in a technical curriculum. Today, manufacturing technology requires technical graduates to possess a systems approach to plant operations and troubleshooting. These systems often consist of multiple and differing technologies. Thus the department chair must structure the learning experience to achieve the development of competencies through multiple projects simulating the manufacturing systems environment. This task requires and benefits from a close collaborative relationship with the industries served and by advisory committees that give perspective. A similar collaboration occurring through the Multi-State Advanced Manufacturing Consortium (M-S AMC) has produced 20 industry vetted courses, containing competencies that can further assist the department chair. These are available through the Resource tab on the national M-S AMC Web Site.

Performance within these curriculum projects becomes the measurement system that validates the achievement of the competencies.

Establishing milestone projects made up of several technologies allows the department chair to develop curriculum competencies using an integrated systems approach. Additionally asking students to come up with multiple solutions to project problems stretches their perspectives and causes them to realize that there are often multiple ways to solve of problem. This process also encourages teamwork and critical thinking, a much needed set of skills in industry.

To this end, a list of considerations is presented that might be summarily contained in a range of projects. These projects can then be assessed through use of rubrics made up of elements of the list below.

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Skills Demonstrable

- What tasks/skills are required to do the job?
- How & where should skill be demonstrated?
  - Student observation of a demonstration of the skill required? (Instructor demo, online demo)
  - Student participated or assisted in demonstrating the skill?
  - Student demonstrated the skills unassisted?
  - Student can teach the skill to someone else?

Knowledge Element

- What does the student have to know in theory and in practice to do the task or demonstrate the skill?

Attitude

- What attitude about safety, cleanliness, co-workers, equipment should prevail about this task
- What elements of problem solving need to be taught and demonstrated with regard to this task?
- What goals need to be set in the task to enable the operator to self-regulate?
- Teach and measure the proper strategies such as time management, productivity, problem solving, troubleshooting in order to obtain a powerful performance of this task.
- Teach and measure the student's ability to self-evaluate and determine if the task met their pre-set goals?

Use of Tools

- What tools/equipment/books/resources/online access/instructor information does the student need to be able to use?
- Teach and measure the ability to use required resources efficiently for this task?

Related Safety

- What safety measures will industry require for specific task/job with regard to the operator(i.e. Personal Protective Equipment)
- What safety measures will industry require for specific task/job with regard to the nearby co-workers?

Communication

- What terminology must the student know to communicate effectively with others? (i.e. Operation, Technician, Supervision)

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Advisory Committee Meeting Minutes

Meeting Date: **Location:** **Time:**

Members Present: **Members Absent:** **Guests:**
(Please list all names in alphabetical order by last name)

Items	Discussion	Action / Recommendations
1. Welcome / Introductions		
2. Previous Minutes		
3. Reports		
4. Previous Business ***Key Items to Discuss at every meeting*** - Program Review - Equipment/Technology - Professional Dev. - Apprenticeship Programs, Co-op & Placement Data		

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5. New Business		
6. Grants & Projects		
7. Open Discussion		
Adjournment	There being no further business or discussion the meeting was adjourned: Submitted by: _____ Meeting Chair:	

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Advisory Committee Member Evaluation

(To be completed annually by members of the committee)

Program: _____

Date: _____

As part of the College's focus on continuous improvement, this evaluation has been developed to capture information from Committee members on the effectiveness of advisory committees at Spartanburg Community College. Please respond to the following statements by indicating if you Agree or Disagree. If you have little knowledge of the statement or if it does not apply, please mark Not-Applicable.

A. ADVISORY COMMITTEE'S ROLES AND PURPOSE **This committee:**	**AGREE**	**DISAGREE**	**NOT APPLICABLE**
1. Provided input into the review and revision of the program's purpose, goals, objectives, and course offerings.			
2. Reviewed and provided input into the program's student learning outcomes.			
3. Reviewed existing equipment and technology utilized by the program(s).			
4. Recommended new/projected equipment and technology for the program(s).			
5. Provided professional development opportunities or cooperative work experiences for students and/or faculty as appropriate.			
6. Provided assistance with student recruitment and job placement, as appropriate.			
7. Actively participated in the meetings by providing guidance and direction for the program.			

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B. ADVISORY COMMITTEE MEETINGS	AGREE	DISAGREE	NOT APPLICABLE
1. Meetings were productive representing time well spent.			
2. This committee's membership is appropriate.			
3. The meeting times of this committee are convenient.			

Please provide any additional comments that would help improve advisory committee effectiveness at Spartanburg Community College.

_____

_____

_____ *Thank You!*

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Sample Advisory Committee Meeting Agenda

I. Greetings, Introductions, & Thanks

II. Previous Minutes

III. Key Discussion Items:

- Program Review
  - Changes in Competencies
  - Changes in Performance Based Objectives
- Equipment/Technology
  - Technology becoming obsolete
  - New and Emergent Technology in Manufacturing
- Student/Faculty Professional Development
  - Changes as above requiring additional professional development
- Apprenticeship Programs, Cooperative Opportunities & Placement Data

III. Reports

IV. Grants & Projects

V. New Business

VI. Open Discussion & Committee Recommendations

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Manufacturing Education Systems' Process Model Template

The next page contains a blank "Manufacturing Education Process Model" that can be a useful tool in the development of a manufacturing course or curriculum.

M-S AMC [Multi-State Advanced Manufacturing Consortium]

COLLEGE NAME Manufacturing Education Process Model

STAKEHOLDER REQUIREMENTS

1 DEVELOP COMPETENCY BASED CURRICULA & CREDENTIALS

2 TRANSFORM INSTRUCTIONAL DESIGN & DELIVERY

PEOPLE

MANUFACTURING EDUCATION PROCESS MODEL

STAKEHOLDER SATISFACTION

4 DEVELOP NEW ADMINISTRATIVE STRUCTURES

3 RE-DESIGN STUDENT SUPPORT, SUCCESS & PLACEMENT

5 DEVELOP NATIONAL SUPPORT SYSTEMS

6 **EVALUATION:** MEASUREMENT & FEEDBACK

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