Assessing Educational Pathways for Manufacturing in Rural Communities: An Investigation of New and Existing Programs in Northwest Florida

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Purpose
- Investigate the alignment of educational opportunities, employer needs, and new employee experiences in Advanced Manufacturing
- Test the usefulness of tools and processes developed to assess such alignment
- Confirm the viability of an approach for analyzing career pathways in other STEM-oriented technician programs
- Improve rural manufacturing capacity by better understanding the relationships among curriculum, employer expectations, and student readiness for jobs in AM

Research Questions
RQ1. How do the AM competencies graduates gain through Associate's level AM programs compare to the needs of employers?

RQ2. How do the AM competencies graduates gain through Associate's level AM programs compare to the skill sets new professionals need?

RQ3. What are the differences between the skill sets employers need and the skill sets new professionals report they need?

RQ4. How can AM curricula be modified to best meet the specific needs of AM employers and AM employees?

RQ5. To what extent are AM graduates prepared to engage in entrepreneurial and intrapreneurial activities?

Syllabi analysis process

Initial Step 1. Define Advanced Manufacturing
1. Gather definitions from canonical literature, scholarly literature, popular literature, professional society publications, and policy documents
2. Analyze and synthesize definitions
3. Answer key questions:
   - How do researchers define Advanced Manufacturing?
   - How do researchers' definitions compare to the definitions from government and industry?
4. Preliminary results suggest 4 different ways to categorize AM definitions:
   - According to baseline technologies used
   - According to the processes involved
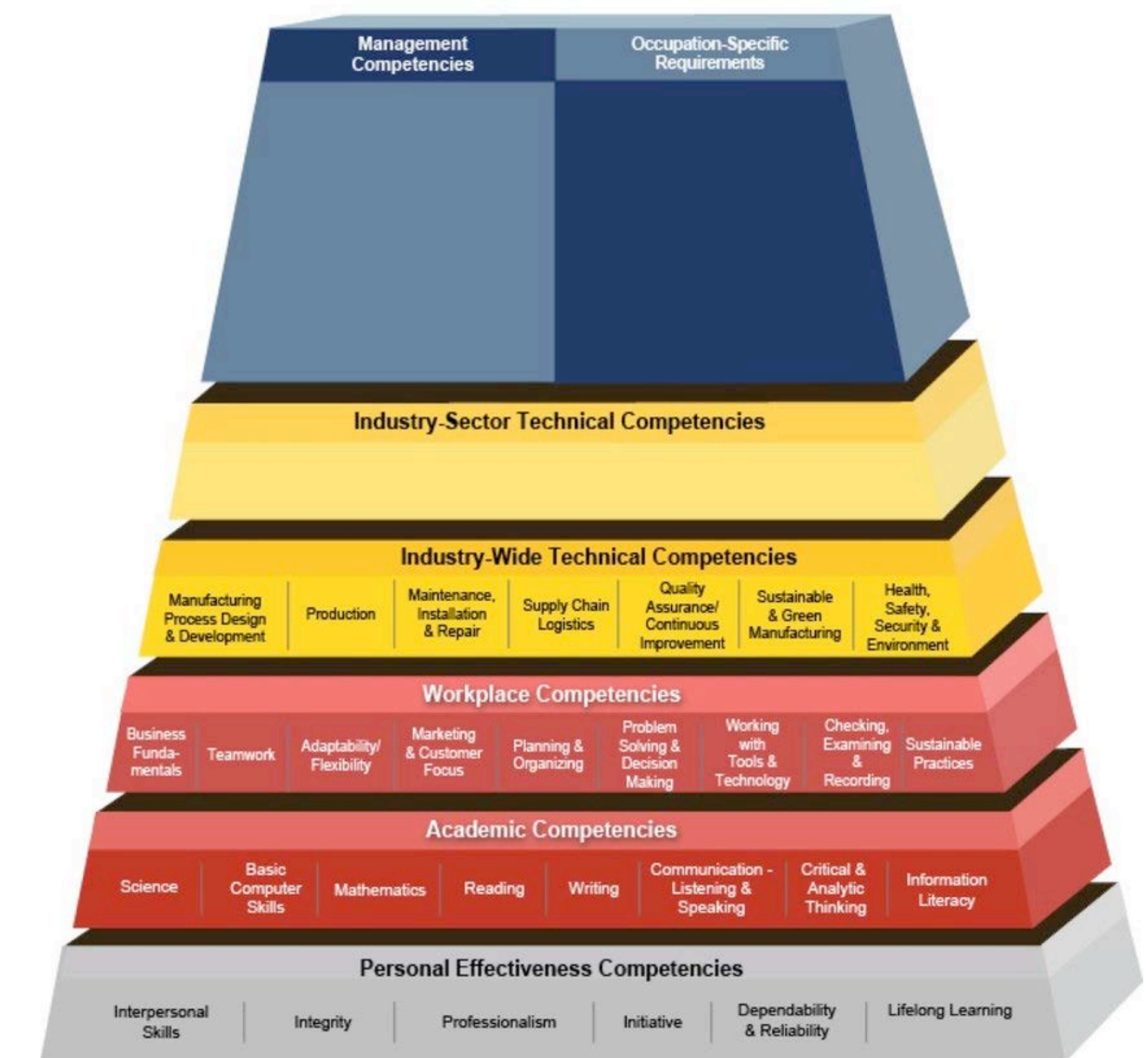   - Industry sector where these are used

Initial Step 2. Analyze Disciplinary Models
1. U.S. Department of Labor Competency Model
2. SME Four Pillars of Manufacturing Engineering
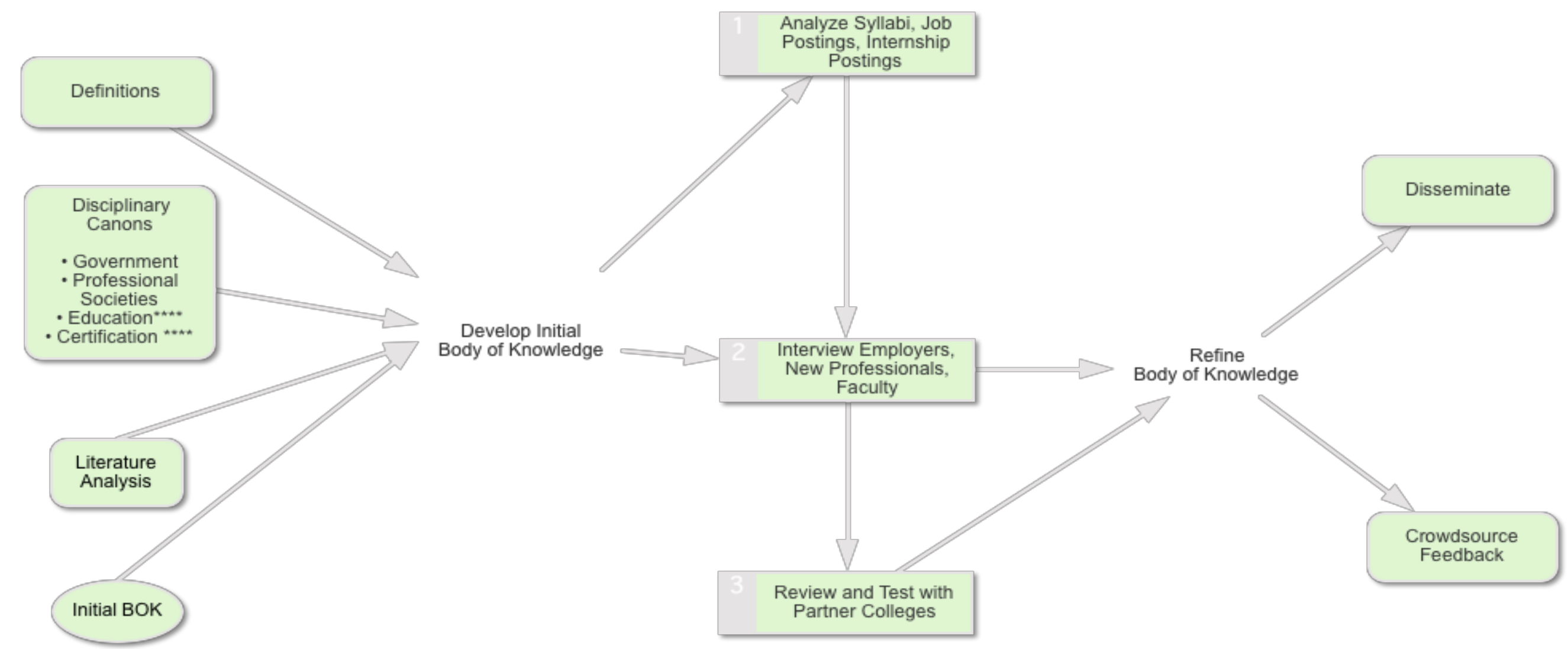3. NAM –endorsed Manufacturing Skills Certification System
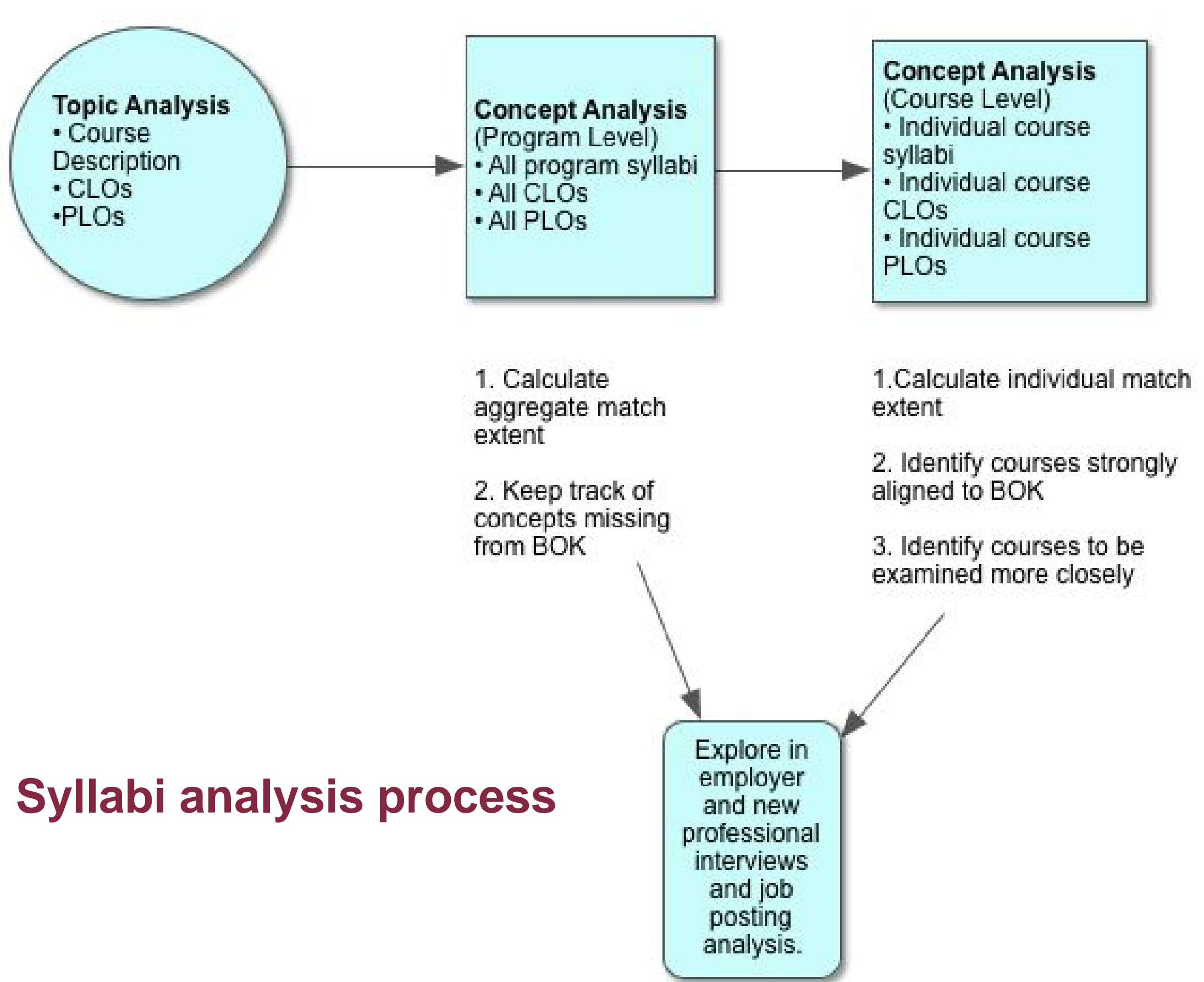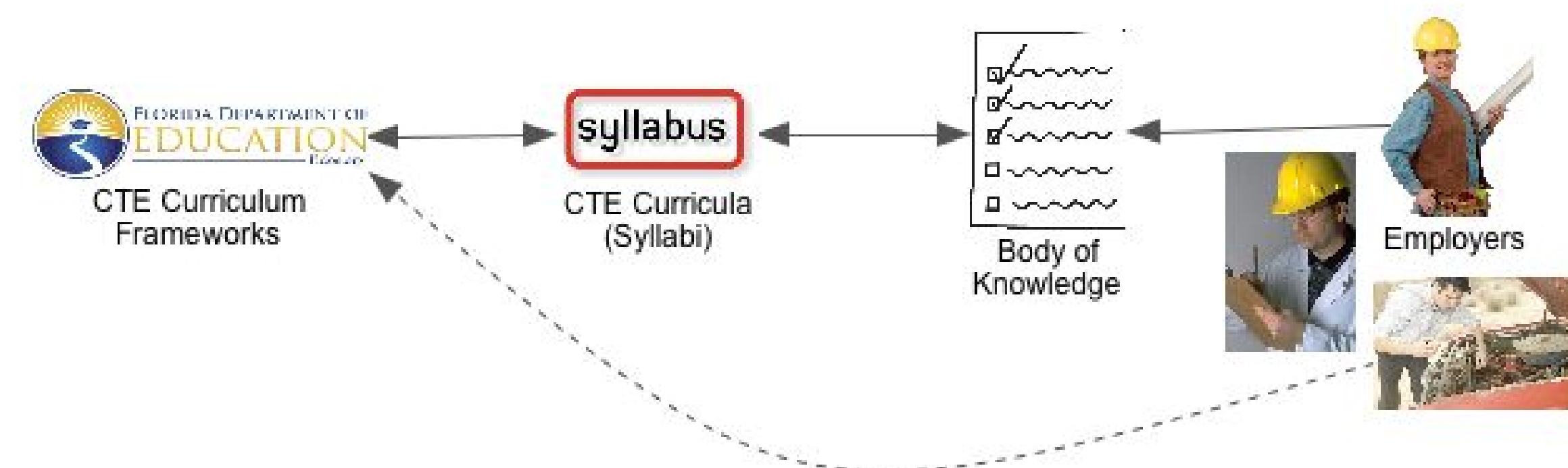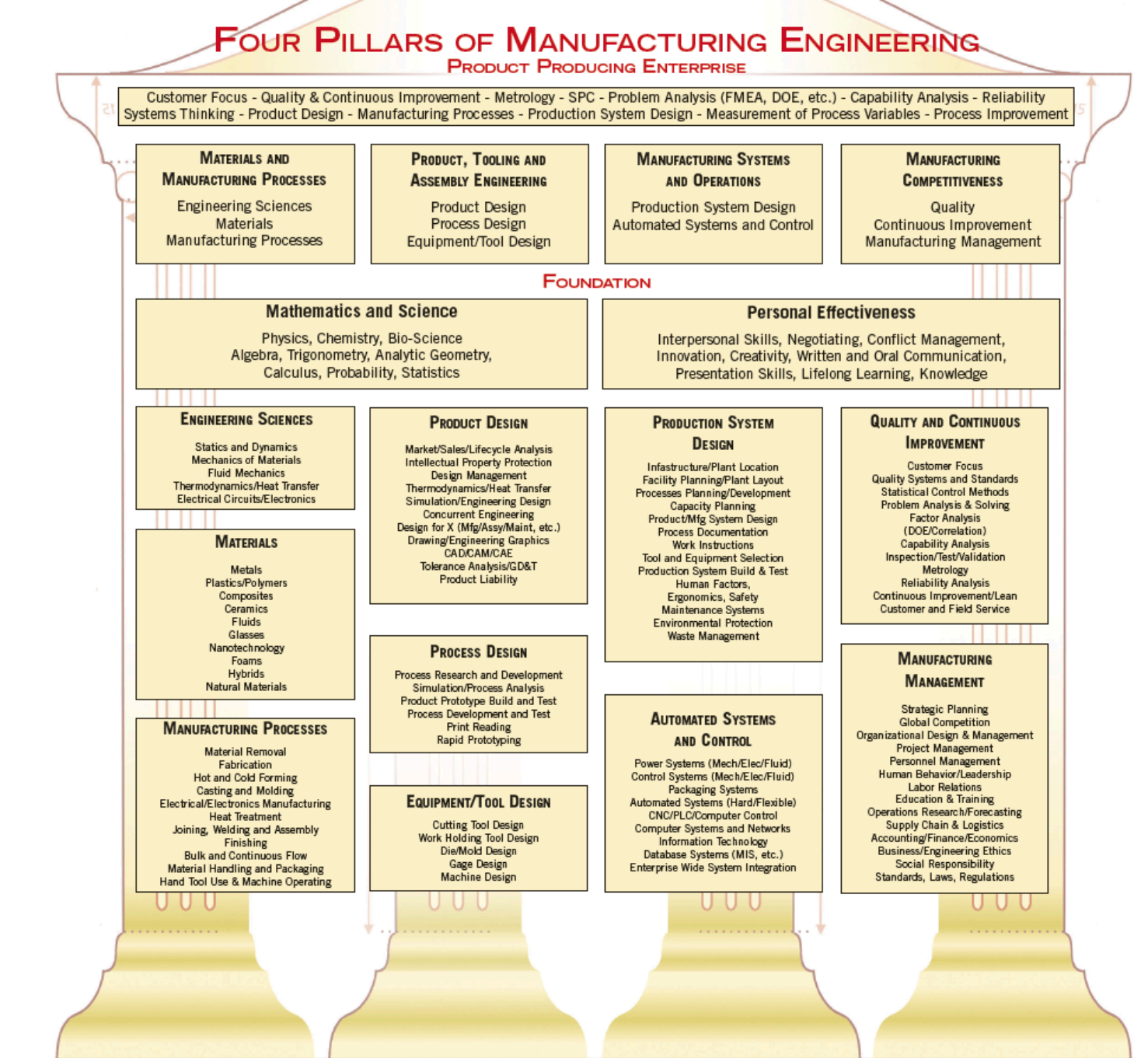
Initial Step 3. Build a Body of Knowledge
- Key step in assessing curriculum fit with industry needs

- Year 1
  - Develop initial BOK
  - Test on syllabi
  - Review with partners
- Year 2
  - Test against interview data
  - Refine
  - Review with partners
- Year 3
  - Scholarly dissemination
  - Crowdsource feedback

Ongoing Research Activities
1. Content analysis of AM course syllabi using BOK
2. Content analysis of NW Florida AM job and internship postings using BOK
3. Interviews with AM educators coded with BOK
4. Interviews / Focus Groups with NW Florida AM employers coded with BOK
5. Interviews with NW Florida new professionals coded with BOK
6. Research Capacity Building Activities with Partner State Colleges: Research Technique Modules; Annual Meetings; Regional College Academies

DOL Advanced Manufacturing Competency Model

SME Four Pillars of Manufacturing Engineering

Broader Impacts of the Project
1. Centered in and serves a representative highly diverse rural locale
2. Close involvement of regional AM employers and workforce groups is pivotal in the research plan development and is a key aspect dissemination and sustainability.
3. An Academy in which collaborating colleges build capacity for ongoing AM program improvement and workplace needs support
4. Outcomes will add to the knowledge of student engagement and successful curriculum frameworks. The anticipated inquiry regarding student desired outcomes from training and employer perception of student skills upon hiring is transferrable to other regions.

Acknowledgements & References