

# *External Curriculum Reviews For Project Impact (2 Sessions)*

===== Report Date of March 27, 2016 =====

*For the Project:  
Innovations Moving People to Achieve Certified Training*

**Project IMPACT**  
Innovations Moving People to Achieve Certified Training

ABOUT TRAINING PARTNERS RESOURCES NEWS

This certificate offers courses that align with the nationally-recognized Manufacturing Skill Standards Council (MSSC) Certified Production Technician (CPT).

**Set Yourself Apart**  
in a high-wage, high-demand career in manufacturing.  
Earn skills and industry-recognized credentials.

- Advanced Manufacturing
- Mechanics
- Quality Technology
- Drafting and Design
- Welding
- Instrumentation
- Energy Operations

**Growing Nebraska's Workforce**  
Nebraska needs more highly skilled workers for high-paying advanced manufacturing careers. Many potential workers lack the skill sets needed, do not have the resources necessary for receiving the credentials or degrees required, and the current training programs do not provide the flexibility to work while furthering education. Project IMPACT addresses these challenges and aims to increase achievements of certifications, credentials, diplomas, and degrees through blended learning combining experienced instructors, advanced labs, and modern technology that will help support participants in their journey to set themselves apart.

Central Community College Metropolitan Community College Northeast Community College Southeast Community College Western Nebraska Community College Nebraska Lincoln

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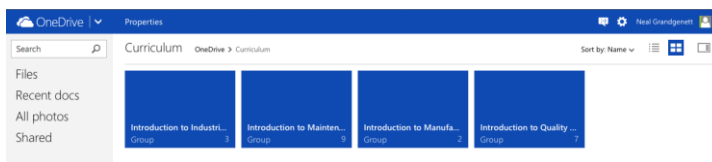
# ===== Curriculum Review Report =====

## 1. Introduction and Project Context:

This document is an external evaluation report that summarizes two different formative evaluation reviews of the curriculum for Project IMPACT. Curriculum reviews were conducted first on June 1, 2014 and then a second time on December 15, 2015. Both of these reviews took place in Lincoln, Nebraska.

Project IMPACT, as a Department of Labor funded initiative, aims to increase the achievement of certifications, credentials, diplomas, and degrees through blended learning combined with experienced instructors, advanced labs, and modern technology in the context of a new Diversified Manufacturing Technology Certificate. Central Community College (CCC) is leading a partnership of five Nebraska community colleges including CCC and Metropolitan Community College (MCC), Southeast Community College (SCC), Northeast Community College (Northeast), and Western Nebraska Community College (WNCC) to expand and to improve education and career training programs to U.S. Trade Adjustment Assistance (TAA) eligible workers, veterans, unemployed and underemployed workers, and traditional students.

The focus of the curriculum-related formative review process, as represented by these two curriculum reviews, was to help the Project IMPACT team in the refinement of a four-course curriculum, by providing systematic external expert reviews, partner input, and staff reflection. As described in the project documentation available on the OneDrive for Project IMPACT, and its project website at [www.impactnebraska.org](http://www.impactnebraska.org), the Nebraska Diversified Manufacturing Technology Certificate offers the four courses with an intent to align with the nationally-recognized Manufacturing Skill Standards Council (MSSC) Certified Production Technician (CPT)



credentials. The courses include:

- Introduction to Industrial Safety
- Introduction to Quality and Continuous Improvement
- Introduction to Manufacturing Technology
- Introduction to Maintenance Technology

Project IMPACT uses a blended learning approach in the courses, including 3D/4D graphic simulations of manufacturing equipment and industrial environments, a traditional classroom experience, and online coursework. Mathematics remediation, reading comprehension, and writing are also covered in the context of the certificate courses for those needing a refresher.

The project also assists students through a participant coach, whose goal is to support students both academically and personally in their individual endeavors. Those services include academic advising, one-on-one personal coaching, and opportunities hosted throughout the year to help students to obtain skills across a wide variety of topics such as financial planning, goal-setting, resume writing, interviewing, problem-solving,

conflict resolution, leading a balanced life, stress management, teamwork, and being a successful employee. Cognitive and physical assessments in Project Impact are available as part of the support program, that introduces them to thinking about their goals by discussing their past successes and how they were achieved, walking through potential barriers that could arise, and finally creating a plan to reach their ultimate goals.

Another distinctive element of Project IMPACT is that students can take advantage of the ERGOS assessment, where the student will perform a series of everyday tasks that would be similar to their job functions in industry. After the tasks are complete, the students will receive a report discussing the strengths and weaknesses that were found and how that will affect them in their chosen field of study. In addition, Second Life<sup>®</sup> is also a part of Project IMPACT, and is a Virtual 3D environment in which a virtual island will house several virtual manufacturing facilities. Students will eventually be able to tour the island and participate in activities that align with their classes in the Diversified Manufacturing Technology Certificate. Examples of these activities include exploring potential jobs in manufacturing related careers as well as interactive quizzes, lectures, workshops, study groups, and other socialization focused curricular enhancements. It is important to note that the Second Life component of Project IMPACT was shown in other meetings with the evaluation team, and that both of the project curriculum review facilitators were very familiar with Second Life as an interactive learning technology, that supports the overall Project IMPACT efforts as a specialized curriculum component.

The evaluation process described in this report is related to an expert review within the context of two structured focus groups that included specialists as described in the next section. These specialists assembled at either or both of the review sessions in Lincoln. The review team was given prior access to an electronic folder and full login privileges, as would be viewed by the instructors and students. In addition, resources, such as course syllabi, were also reviewed. Feedback from the focus group, as well as the prior review of the IMPACT documents, was then the basis of this report.

## **2. The External Facilitators:**

The external facilitators for the curriculum review process, and the leadership of both of the focus groups, consisted of two experienced curriculum evaluation consultants, Dr. Neal Grandgenett and Dr. Elliott Ostler, each of the University of Nebraska at Omaha. Together, Drs. Grandgenett and Ostler have nearly 50 years of curriculum development and evaluation work, in many federally funded projects. Dr. Grandgenett was the lead review facilitator and Dr. Ostler assisted him in the review process related to the evolving IMPACT curriculum. The evaluation team worked closely with the participants of the curriculum review focus groups to help to ensure that the feedback contributed to overall curriculum investigation, refinement and improvement. The background of each of the two lead facilitators is now described.

Dr. Neal Grandgenett: Dr. Neal Grandgenett is the Dr. George and Sally Haddix Community Chair of STEM Education at UNO, where he coordinates the campus STEM priority and teaches courses in interdisciplinary STEM learning, research and evaluation. He has authored over 130 STEM-related publications and is a frequent project evaluator having evaluated nearly 30 different large-scale projects for the U.S. Department of Education, NSF, the National Academy of Sciences, and various other national, state, and private agencies. He is also a review editor for the international journal, *Mathematics and Computer Education (MACE)*. Dr. Grandgenett has received various awards for his work, including the UNO Chancellor's Medal, the Alumni Teaching Award, the Distinguished Research and Creativity Award, the Nebraska Technology Professor of the Year, and the NASA Mission Home Award. He has also presented at numerous national and international conferences related to STEM Education and Project Evaluation.



Dr. Elliott Ostler: Dr. Ostler is a Professor of STEM Education in the College of Education at UNO, where he teaches courses in curriculum design, interdisciplinary STEM instruction and research. He is a well-respected curriculum and evaluation expert who is on the College Board National Consultant Advisory Panel and is College Board Trainer for Pre-AP Vertical Teams in Mathematics and AP Assessment. He has published nearly 100 journal articles and papers related to STEM curriculum, including four textbook resource publications. He also holds a United States Patent (#D506938) for an *Improved Ruler Set* for Mathematics Instruction, which is an original Invention for middle and secondary level mathematics education. He is a frequent NASA product review consultant for NASA education products in the *Institute for Global Environmental Strategies (IGES)* and a periodic reviewer of National Science Foundation curriculum-based grants.



### **3. Full Curriculum Review Focus Group Team:**

The curriculum review process included the following team members whom provided both an external perspective, as well as an internal source of curriculum explanation and questions for one or more of the focus groups. The review team included the following members.

#### **Focus Group Participants:**

Dr. Neal Grandgenett, Facilitator  
UNO, Haddix Community Chair of STEM Education

Dr. Elliott Ostler, Co-Facilitator  
UNO, Professor of STEM Education

Dr. Mike Shain, External Evaluator Project IMPACT  
President, Shain Evaluation and Consulting, Inc.

Mr. Dan Davidchik, Project IMPACT Manager  
Central Community College, Columbus, Nebraska

Ms. Jamey Peterson-Jones, Project IMPACT Curriculum Designer  
Central Community College, Columbus, Nebraska

Ms. Beth Vavrina, TAA Project IMPACT Site Coordinator  
Southeast Community College, Lincoln, Nebraska

Ms. Shannon Okray, Job Training Program Coordinator  
State of Nebraska Department of Labor, Lincoln

Mr. Dwayne Probyn, Executive Director  
Nebraska Advanced Manufacturing Coalition, Lincoln

Ms. Rachael McLeod, Director of Resource Development  
Southeast Community College, Lincoln

Ms. Erika Volker, Administrative Director  
Partnerships for Innovation, Lincoln

Ms. Whitney Baumgarner, Advisory Council Coordinator  
Nebraska Department of Economic Development, Lincoln

Mr. Tony Glenn, Skilled and Technical Sciences Career Field Specialist  
Nebraska Department of Education, Lincoln

Ms. Robin Coan, Curriculum/Engagement Coordinator  
Central Community College, Columbus

Mr. Robert Caldwell, Site Coordinator  
Metropolitan Community College, Omaha

Ms. Colleen Nienaber, Virtual Site Coordinator  
Central Community College, Columbus

Ms. Kate Loden, Participant Coach / Site Coordinator  
Southeast Community College, Columbus

#### **4. Agendas Used for the Curriculum Review Focus Groups:**

As mentioned, the curriculum review process used two different focus group interactions (one on June 1, 2014 and then a second one on December 15, 2015). Both of the reviews took place in Lincoln, Nebraska. At the focus groups, the available members (about 12 participants each session) stepped through the IMPACT curriculum. During the sessions, notes were taken to acknowledge where the curriculum appeared strong,

where it might be improved, and then other thoughts as perceived within the discussion process. The two focus group agendas were similar, and followed a relatively structured discussion process. The two agendas now follow on the next page, with the second agenda representing a timeframe of about 18 months after the first agenda.

**Agenda for IMPACT Curriculum Review**  
June 1, 2014; Lincoln, Nebraska

- 9:00 am Introductions of Participants (All)
- 9:10 am Intent of the Curriculum Review Process (Mike, Neal, Dan)
- 9:15 am Introduction of Curriculum and Review Constructs (Neal, Elliott)
- Curriculum: A group of planned educational offerings including materials, exercises, and activities intended to create a change in knowledge, behavior, or action (ISU)*
- Curriculum Review: Evaluation of educational offerings, delivery, and evaluation of those activities designed for a specific audience to maintain consistent standards of quality and credibility (ISU)*
- 9:30 am Reminders of the Intent of the Curriculum for IMPACT (all)
- 10:00 am A Structural Look at the Four Courses
- 11:00 am Reflecting on Materials, Exercises and Activities
- 12:00 Noon Lunch and Further Conversation (On-Site)
- 1:00 PM Considering Curriculum Strengths and Areas of Potential Improvement
- 2:00 PM Reviewing Key Points to Make in the Report
- 2:30 PM Report Next Steps and Strategies for Engaging Others
- 3:00 PM Adjourn



**Agenda for IMPACT Curriculum Review (2<sup>nd</sup> Edition)**December 15<sup>th</sup>, 2015, Lincoln, Nebraska

- 9:30 am Introductions of Participants (All)
- 9:45 am Intent of the Curriculum Review Process (Mike, Neal, Dan)
- 10:00 am Introduction of Curriculum and Review Constructs  
(Neal, Elliott)
- Curriculum: A group of planned educational offerings including materials, exercises, and activities intended to create a change in knowledge, behavior, or action (ISU)*
- Curriculum Review: Evaluation of educational offerings, delivery, and evaluation of those activities designed for a specific audience to maintain consistent standards of quality and credibility (ISU)*
- Checklist Reminders and Overall Process*
- 10:30 am Reminders of the Intent of the Curriculum for IMPACT (all)
- 10:45 am A Structural Review of the Four Courses
- 11:15 am Review of Materials, Exercises and Activities  
(Strengths, Potential Issues and Recommendations)
- 12:00 Noon Lunch and Continued Conversation
- 12:30 PM Introduction of Sustainability/Scaling Format
- 1:00 PM Individual CCs Processing Sustainability/Scaling & CC Culture
- 2:30 PM Report Out on Draft Plan (w/Feedback)
- 3:00 PM Adjourn

## ===== Feedback on the Curriculum =====

### 5. Process:

The process related to the two focus groups for feedback on the IMPACT curriculum was purposefully structured to be very candid, reflective and using fully open dialogue. Generally, the review conversations started with a walk through selected curriculum elements by either the IMPACT Project Coordinator, or the IMPACT Project Director. Following a typical curriculum review format, the strengths observed were then acknowledged. After that acknowledgement, the conversation was then steered toward areas of potential improvement. Questions were asked at any time. The facilitators ensured that the conversations moved along efficiently. In addition, a set of curriculum definitions, and a curriculum review rubric were available and used by the team at both sessions, as developed by Iowa State University, and that is included in the appendix of this report.

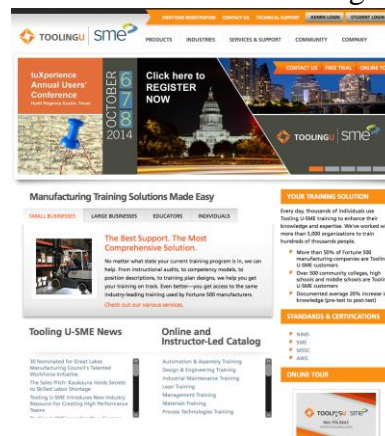
### 6a. Focus Group 1 (June 1, 2014) - Strengths of the Curriculum:

The following comments surfaced related to the perceived strengths of the curriculum, as the review focus group progressed over the June 1, 2014 discussion timeframe. Overall, the team had lots of very positive comments about the emerging structure, strategy and progress of the curriculum, and was generally quite impressed with the IMPACT curriculum to this point in time. The following are some comments that surfaced for the first focus group.

- 1) It was first acknowledged that organizing a functional curriculum of four shared courses, and a related certificate, across five community colleges is indeed a daunting curriculum-related task, and the project was commended for having operationalized a collaborative structure for such an extensive curricular endeavor.

Excel Online - OneDrive			
5-29 Introduction to Industrial Safety			
FILE	DOWNLOAD	SHARE	DATA
A	B	C	D
1	Degree/Diploma: Manufacturing Generalist		
2	Course: Manufacturing Safety		
3	Session 1	Lesson Plan for:	Manufacturing Opportunities
4		Session Summary:	This session introduces students to manufacturing as a career, including related rewards, challenges, and re
5		Objectives:	Describe the growth of manufacturing and career opportunities Explain support industries within manufacturing Describe the importance of frontline production workers. Explain the need and advantages of cross-training employees Identify challenges and benefits of a diverse workforce.
6		Description	Delivery Method
7		ToolingU Reading Assignment	Online learning
8		Activity	Supervisor Essentials - Managing a D
9			16.
10		Learning	
11		Discuss manufacturing related historical issues, sub-industries, and potential opportunities.	Lecture/Lab
12			Invite local manufacturing business
13		Discuss responsibilities, challenges, opportunities and rewards for diversity in the workplace.	Web-Enhanced Lecture
14			Read/Review ToolingU Managing a D
15			16.
16		Evaluation	Instructor observations, assign homework or quiz.
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- 2) The curriculum itself is quite extensive, and includes interrelated instructional support mechanisms such as: the four courses, the certificate, syllabi, course lessons, Tooling U, One Drive access, coaching support by advisors, IMPACT lead instructor professional development, and various integrated activities and assessments.
- 3) Tooling U is used as a well-integrated and customized instructional resource in the curriculum, which appears to support both sustainability and cost effectiveness, as an “80% solution” to the student interaction and support that also provides automatic documentation of the completion of various curriculum elements. It also provides some potentially useful reporting components such as completed classes, time spent in class, exams, note taking, print capabilities and student log in histories. The variety of Tooling U assessments (true-false, matching, multiple choice, etc.) is also a curricular strength.
- 4) Overall, there appears to be a useful blend of basic and higher order instructional strategies within the curriculum activities, as well as individual sessions, providing some instructional flexibility for instructors and institutions.
- 5) The four courses, as defined by carefully organized syllabi, appear to align well into “stackable achievements” for students that provide a convenient student pathway into a certificate, to a diploma, and ultimately to a degree.
- 6) Contextual remediation is integrated into the curriculum and support mechanisms, allowing possible student remediation within the context of mathematics, reading, and writing.
- 7) The organizing of the four course structures into small “session units” appears to work well for establishing convenient units of focused instruction.
- 8) There is a well-organized spreadsheet overview of the course content, covering 30 sessions and providing content flexibility by college as well as structural guidance and assistance to instructors.



COURSE SYLLABUS	
Course Number:	TBD
Course Title:	Introduction to Industrial Safety
Course Pre-requisites:	None
Course Credit Hours:	3 Credit hours
Structure of Course:	45/0/0/0
Textbook:	Tooling U-SME Online resource
Course Description:	This course is designed to provide students with a general understanding of common manufacturing safety standards and concerns. Students will be introduced to OSHA, OSHA's role in prevention and elimination of work-related injuries, employer and employee rights and responsibilities, inspection process, reporting and recordkeeping, personal protective equipment, chemical, fire and electrical hazards, confined space and others. This course aims to present an overview of basic workplace hazards and how you can protect themselves from them.
Competencies:	Upon completion of this course, the student will be able to: <ul style="list-style-type: none"> <li>A. Identify manufacturing and its impact on the economy.</li> <li>B. Interpret the purpose of the OSH Act, the functions of OSHA, and common OSHA standards that apply to manufacturing.</li> <li>C. Identify the purpose of safety policies and procedures and analyze safety program management principles.</li> <li>D. Explain guidelines for equipment monitoring and safety.</li> <li>E. Demonstrate the ability to recognize, evaluate, and control unsafe conditions through practices and corrective actions.</li> <li>F. Provide a clear understanding of safety in the workplace.</li> <li>G. Advise proper use, handling, storage and disposal of materials safely.</li> <li>H. Evaluate appropriate safety precautions and use of equipment.</li> <li>I. Identify the need for emergency plans and performance of emergency safety drills.</li> </ul>
Course Outline:	<ol style="list-style-type: none"> <li>1. Manufacturing Opportunities <ul style="list-style-type: none"> <li>a. Describe the growth of manufacturing and career opportunities</li> <li>b. Explain support industries within manufacturing</li> <li>c. Describe the importance of foodline production workers.</li> <li>d. Explain the need and advantages of cross-training employees</li> <li>e. Identify challenges and benefits of a diverse workforce.</li> </ul> </li> <li>2. Manufacturing and Society <ul style="list-style-type: none"> <li>a. Describe the importance of technical education and training related to careers in manufacturing.</li> <li>b. Explain the essential education and skills needed for careers in manufacturing.</li> </ul> </li> </ol>

9) The ongoing attempts to align the curriculum with business and industry perspectives as well as national certificates, through the strategic use of an advisory council, partnership meetings and personalized conversations with business and industry representatives appears to a useful strategy to directly support both the ongoing relevance and sustainability of the curriculum.

10) The four courses, and their appear to allow good instructor flexibility in the learning process, while keeping content as stable as possible. The curriculum also appears to be aligning well with the instructional resources and expertise as provided by the five partner community colleges and the University of Nebraska at Lincoln.



### **6b. Focus Group 2 (December 15, 2015) - Strengths of the Curriculum:**

The following comments surfaced related to the perceived strengths of the curriculum, as the 2nd review focus group progressed over the December 15, 2015 discussion. The efforts of all five IMPACT Community Colleges were again considered, including Central Community College (CCC), Northeast Community College (NECC), Southeast Community College (SCC), Metropolitan Community College (MCC), and Western Nebraska Community College (WNCC).

By the time of this second focus group, the project had now established four very robust courses, including courses with themes in Safety, Quality, Production, and Maintenance. The course development and implementation efforts had been very synergistic with the use of the resource Tooling U, which has been used as a carefully aligned instructional resource. Efforts in Second Life had also continued and evolved, as well as work with the University of Nebraska Lincoln with various workplace assessments such as the ERGOs system. Discussion on the strengths included the following bullet points.

- 1) Project IMPACT has steadily evolved into being a “successful example” of how Nebraska Community Colleges can work together successfully as well as with the NU system on complex instructional efforts and large collaborative projects.
- 2) From its inception, Project IMPACT has worked to meet industry needs associated with Diversified Manufacturing. Many businesses in Nebraska have been receptive to these efforts and there is a broad foundation for further work and sustainability.
- 3) Tooling U has been well embraced by the faculty and students. It is a great instructional resource that is being seen as user-friendly, cost effective (compared to textbooks), customizable, flexible, and closely aligned with industry needs. Tooling U is less expensive than typical textbooks and there is a reduced cost for high school students.

- 4) Some career academies have evolved through Project IMPACT, such as for example, the Metropolitan Community College's recent efforts in Fremont, Nebraska which has involved 17 students new to higher education in this first session.
- 5) Project IMPACT has encouraged an effort by Community Colleges to "benchmark" progress in building their manufacturing programs – allowing for transferability, including into two-year and four-year programs.
- 6) Credentialing is becoming more important for Community Colleges and Project IMPACT has represented a shared investigation and effort into increased credentialing opportunities.
- 7) Project IMPACT has helped to contribute to marketing efforts, both internal and external to individual colleges and has helped DMT certification to increasingly become a shared "brand" that crosses colleges. The five colleges have consistently worked together collectively to "sell" DMT externally.
- 8) Second Life as an interactive teaching tool has been a vital "value-added" to some of the collaborative efforts, including keeping instructional technology on the forefront of shared learning environment thinking and planning for the colleges.
- 9) Project IMPACT has steadily investigated and initiated assessments using the ERGOS system. Instructors have been supportive of the process, and there has been perceived value for both students AND instructors.
- 10) There has been a culture of "lessons learned" where the five community colleges share openly what has worked and what has not worked, in order to help colleagues avoid repeating what's not working.
- 11) There has been a steady transition toward sustainability in efforts to market DMT certification at each Community College.
- 12) All five Community Colleges have agreed that contextual remediation has been a very important and useful Project IMPACT component, while representing a great "value-added" and enabling expanded work with the Math and English departments.
- 13) Coaching has also been an essential element of Project IMPACT success allowing for "tailored guidance" where coaches can adapt a plan for the students to be increasingly successful.
- 14) Coaching has expanded across the five colleges, and Project IMPACT has become an "example" for other programs across the country.
- 15) Second Life has generally been well received, with a popular demonstration undertaken recently at the new Omaha "Do Space" that helped to showcase shared efforts.
- 16) Many new instructional lessons and modules have been aligned with wider industry considerations such as for example, OSHA certifications and guidelines.

### **7a. Focus Group 1 (June 1, 2014) Potential Improvements:**

It is important to note that the initial focus group team was generally quite impressed with the efforts to date, and that the project was still relatively early in the five-year timeline at the time of the 1st focus group. As the purpose of the focus group was generally to provide curriculum suggestions, the majority of the time was spent in discussing potential curriculum refinements. Naturally, some of these potential refinements may or may not be now seen as useful, and some insights may no longer apply as the IMPACT curriculum continues to be refined with use and sustainability.

- 1) The careful attention and monitoring of the various electronic curriculum structures by Ms. Peterson-Jones (IMPACT Curriculum Designer), is truly an outstanding support mechanism. However, it was unclear how the curriculum would continue to grow and to be supported if Ms. Peterson-Jones were not available. Her ongoing expertise, or someone of equal abilities and technical capabilities, would seem to be critical to a successful future use of the curriculum. It would also seem that an “IMPACT Instructor Guide” or “IMPACT Curriculum Guide” would also be useful for capturing the organizational knowledge for the ongoing use of the curriculum.
- 2) Although the courses can currently be taken in order, it would appear that some encouragement mechanism would be useful for taking the safety course first.
- 3) Later potential expansions of IMPACT curriculum use beyond Nebraska may need to be considered by the planning team, since such extensive federally funded curriculums often receive inquiries from other states.
- 4) It was somewhat surprising that everyone entering into the IMPACT instructional system had full access to the editing and modification structures (with some protections in place). It seemed important for higher levels of security features for editing privileges, in order to prevent inadvertent changes by curriculum users.
- 5) The extensiveness of the curriculum support features are a strength, but instructors may need a 1-page logic model or conceptual overview, to help them to understand how all features interact and support each other for the delivery of the curriculum.
- 6) Course and session titles have been good but may need additional revisions to support the content listed within the aligned lessons.
- 7) There appeared to be a very wide range of readability levels across the various curriculum pieces, ranging from 4<sup>th</sup> grade levels to well above grade 16 levels. Typically, reading comprehension levels should strive for a lower high school level when possible. The readability level of text can be checked using various websites or by using the features of MSWord. See the following website for MSWord steps: [http://www.internet4classrooms.com/technology\\_tutorials/msword\\_readability.htm](http://www.internet4classrooms.com/technology_tutorials/msword_readability.htm)
- 8) Curriculums in areas such as Manufacturing often need periodic reviews and updating as standards change, particularly within the context of problem-based learning strategies. Developing an action plan for future curriculum updates, as standards change, might be helpful to the IMPACT project.

- 9) The use of image copyright is an important consideration in national curriculums, and although there did not seem to be any images in need of change, it might be important for someone to check the remaining work, to ensure that all images used are either cited with permission or come from an open source such as creative commons. In addition, any person identifiable in the pictures (such as an instructor or student) should have a permission form on file for use of the image.
- 10) It was brought up during the focus group conversations, that some instructors were being asked to teach the course based upon the need for load, rather than having a full expertise within the specific course context. This can be a problem for the utility of the curriculum, and especially for the “fidelity” or consistency of the instruction. Fidelity of the curriculum is an essential element on whether a course might transfer effectively both within and outside of the five-college consortium. It was also identified that some instructors, particularly new ones, may need some initial assistance to get started. A well packaged “training” for all instructors would also seem important for maintaining course fidelity. Ideas such as a video “glimpses” of instructors interacting with students were mentioned in the focus group discussions.
- 11) Maintaining the fidelity (consistency) of a large scale, multi-partner curriculum is always a typical problem for large curriculum efforts, and usually works best by keeping the conversation going at the instructor level, with an institutional acknowledgement of the importance of general curriculum fidelity for transfer and replication purposes. If there is a purposeful deviation from the common curriculum lessons or support strategies by a partner, it really helps to have that deviation recognized by all partners, in a periodic disclosure process.
- 12) It can be useful to continue the official “letters of intent” process from key partners on large-scale projects. For example in Project IMPACT, a letter of intent from each college could be provided stating the extent and use of course curriculum, and how they plan to award student accreditation for completion of an intended track(s).
- 13) Short meetings with each of the instructors that will be teaching the course, before they actually teach the course, and perhaps quarterly there after, would appear to be relatively critical for this set of courses. Strategies for instructor training surfaced in the focus group discussions, and included a potential “Show on the Road” strategy, as well as perhaps some sort of online training component, with video samples.
- 14) It would help to capture common instructor and student questions in a short Frequently Asked Questions (FAQ) resource that users of the curriculum could access or have ahead of time as a supporting document. In addition, it might help to have a team establish a documented mapping of the activities between the syllabi.
- 15) The focus group participants talked about the ongoing need to ensure that there is a good media presence for the IMPACT curriculum, such as downloadable flyers and brochures. Such media resources are typically relatively critical for new curriculum efforts, and the course contexts, benefits, requirements and certificate options may need to be fully identified for the students, instructors and institutions that are helping to recruit for the program.

- 16) In most places of the curriculum, it appeared that the fictional names of persons mentioned, were relatively “white/Caucasian” and it seemed that the project might diversify a bit more in the use of fictional names. This is a common review notation for many first reviews of a curriculum.
- 17) A suggested format for assignments that request a student report or open-ended response might be a useful resource to include in the curriculum. For example, reinforcing to student respondents the utility of an introduction-body-conclusion approach when asking for an open-ended response would seem to be useful for enhancing the quality of student responses. Such student suggestions might also be given (or provided by a link) when they are asked to provide a business letter or other professional document as part of their response.
- 18) It was noted that it might be better to not limit the length of student response options, since this is often considered an ADA issue, in that some people write more or less extensively because of hand-eye coordination or eyesight.
- 19) It was noted that in some locations in the curriculum, there was some relatively dense text that increased both its readability, and also potential problems for ensuring full access within the curriculum as identified in ADA guidelines.
- 20) It would seem important to ensure that all pictures are also examined carefully to ensure that people captured within the images are following safety practices, such as wearing safety glasses near machinery, not being distractive around machinery, not wearing watches or bracelets when working at machinery, etc.

### **7b. Focus Group 2 (December 15, 2015) Potential Improvement:**

The second focus group in the curriculum review process was generally quite similar with the previous one, but many challenges had been addressed in one way or another. The project concerns had also generally shifted to long-term sustainability considerations. Thus, a significant majority of the time in the 2nd focus group was spent in discussing project strategies for sustainability. These thoughts surfaced.

- 1) It is unclear how IMPACT might sustain some of the assessment efforts, such as after the grant funding for special assessments ends.
- 2) It would be helpful to have some money to continue to build the instructor pool, and to keep instruction at current levels.
- 3) It is important to continue to build “program laddering” and to integrate program options further with marketing efforts.
- 4) It continues to be a problem to hire and retain qualified instructors, particularly since they can make far more in the manufacturing world. It is also important to match the right instructor to fit for particular courses. It may be that a team approach will be helpful.






- 5) There is limited perception of MSSC/CPT as a value added when compared to completing four courses and getting community college credentials.
- 6) The grant funding initially limited the ability to connect programs to high school students, yet this continues to be a critical pipeline consideration for IMPACT sustainability and scaling. Of course, we will continue to count the number of high school students who have gone through or are in the college IMPACT courses.
- 7) It is unclear the possible connections to home school student recruitment, and that opportunity needs to be further investigated.
- 8) Keeping the website up to date is an ongoing challenge, and it may make sense to revisit the look and utility contexts as we move into sustainability.
- 9) The typical level of quarterly/weekly student workload, often 18 credits per term is often too heavy of a workload for many students. Financial aid and Pell grants are also a consideration. Students sometimes can't complete more than two classes per term due to the workload of the classes.
- 10) Although there has been progress, there is still somewhat of a lack of understanding institutionally about what exactly DMT is – from an internal standpoint – and we will need to continue to build marketing materials and refine our “elevator speech”. Perhaps we could start to parallel our efforts to CNA and nursing credentialing, since that is more widely understood.
- 11) Second Life will be a long-term sustainability challenge. For example, we need to determine how we move forward with who owns Second Life and how it would it be specifically continued. Currently, five separate islands (each CC) walk into a building and have access to all the documents and activities and resources. We will want to revisit how we move forward beyond the grant with Second Life strategies.

### **8a. Focus Group 1 (June 1, 2014) Other Thoughts that Surfaced:**

In addition to the strengths and potential areas of potential improvement mentioned in Focus Group 1, some additional thoughts or comments surfaced in the first focus group conversation that did not fit into either of those two sections, but that might still be of use to consider by the IMPACT staff in future updates of the curriculum. These thoughts are identified in the next section, with the caveat that they might or might not be helpful suggestions, depending on the context.

- 1) It seemed that a standard list of prerequisites at the beginning of each module might be useful, but it was unclear whether this would be a good idea or not, and whether it would instead be best left to individual institutions to provide that information so as to permit a closer alignment with the local courses and context of each college.
- 2) It was acknowledged that the instructional objectives had been rewritten in last few weeks before the focus group meeting, and that some components of the course

structures would need to be adjusted to more closely parallel the new instructional objectives as the course is continued to be reviewed.

- 3) It was acknowledged that there will also be hybrid coursework options (part in person and part online) or even online course options in the future, and that some training on such delivery strategies would be needed, as new formats are embraced by individual institutions for the IMPACT course sequence. It appeared that hybrid or online formats would provide some excellent opportunities for both the fidelity of some curriculum elements, as well some additional flexibility for other components.
- 4) It was acknowledged that although the evolving 2<sup>nd</sup> Life components were not reviewed at this particular focus group, that 2<sup>nd</sup> Life might indeed have some utility in future features of the curriculum, such as for recruiting students, holding student and instructor meetings, demonstrations, questioning, and enhanced coaching. Opportunities for looking at virtual manufacturing tours, interview practicing, and socialization of students with manufacturing professionals seemed clearly a potential value added with 2<sup>nd</sup> Life as well. However, it was also recognized that there could be lots of challenges in operationalizing a 2<sup>nd</sup> Life instructional environment, to make it a true value added in the context of IMPACT instruction. It seemed important that the review of this component include university and curriculum specialists in 2<sup>nd</sup> Life and its ability to potentially maximize the effectiveness of specific curriculum elements.
 
- 5) It was acknowledged by the focus group participants, that the curriculum would generally benefit from a periodic examination of the writing assignments required of students to ensure that they would mimic or mirror the reports required for the jobs.
- 6) It seemed that it might help to have a more consistent format of assignments that were required of students, or at least for Project IMPACT to consider that potential.
- 7) Some referenced employee activities in the curriculum, such as the use of timecards, might benefit from an acknowledgement of newer technologies, and perhaps a reflection or consideration as to whether these activities fit with the particular job being showcased or highlighted in the lesson, session, or course.
- 8) It was discussed that most of the media branding appeared to generally reinforce the IMPACT project rather than the five individual colleges. The team wondered whether it might be helpful in the future to consider a branding process that highlights the colleges as well as the project. Just a thought for consideration.
- 9) It might be helpful to the complete success of Project IMPACT to engage Chief Instructional Officers (CIO's) in providing additional strategies and impetus to full adoption of the program.

## **8b. Focus Group 2 (December 15, 2015) Other Thoughts that Surfaced:**

Similar to the first focus group, in addition to the strengths and potential areas of improvement, some additional thoughts or comments surfaced that did not fit into either of those two sections, but that might still be of use to consider by the IMPACT staff in future discussions. These further thoughts are identified in the next section, with again, the caveat that they might or might not be helpful suggestions, depending on the context.



- 1) It might be a good time for college representatives to meet with cabinet members, the board of governors, and a range of administrative leaders to explore grant-related sustainability, influence instructors to create more long-term buy-in, and to do some positive storytelling about IMPACT and our efforts.
- 2) We may want to remind administrators to be accountable to the past grant program, and to encourage them to continue to advocate for program?
- 3) It might be good to look again at what is emerging on each campus, in particular at the building level and how to continue to support it. It will be nice to find the champions and to further to support them during sustainability.
- 4) We should look more closely at funding from other programs and sources for the possible continuation of various parts of the grant, such as Second Life.
- 5) The IMPACT collaborators should continue to discuss strong long-term outcomes such as certificate, degree, continuing education, etc. to ensure that the end of the pipeline discussions are continuing during this last push of efforts.
- 6) Marketing is continuing to be a challenge, and we perhaps need to revisit shared strategies for effective marketing.
- 7) We should continue to aggressively support increased communication mechanisms between IMPACT collaborators and campuses.
- 8) We might revisit Skills.Commons.com, and perhaps break elements into 3 modules per course (prior learning credits aggregated into one course – pay for credit). We might also look at how to sustain our joint efforts related to Skills.Common.com.
- 9) We still appear to have too much content (45 objectives) to teach during one semester. We may want to gather to again revisit what is “need to know” versus “nice to know”? How many modules in each of the four courses in Tooling U can be covered in a semester when not employed versus the need for having the skills and competencies necessary to be successful on a manufacturing site?

## **9. Final Comments and Thoughts:**

In both of the curriculum review focus groups, the curriculum development, refinement, and implementation process for Project IMPACT, it appears that a strong and conceptually appropriate curriculum was indeed created. A broad range of experienced professionals have provided a strong foundation of expertise and enthusiasm, and a truly innovative manufacturing curriculum has been created, including a certificate, courses, activities, and support strategies that will be both effective and engaging. The five community colleges, partners and stakeholders appear to have worked together relatively well, and that Project IMPACT is will most likely achieve its curriculum-related objectives. Getting five different institutions of higher education to collaborate on any shared curriculum endeavor is really a herculean task, and it is a testimonial to the commitment of the IMPACT leadership team that they have generally been able to pull this off effectively. There are of course many ongoing challenges that still face the project for sustainability, which is again common large scale and diverse curriculum projects, but the IMPACT curriculum appears to be steadily refining, and will increasingly integrate into the individual cultures of the host colleges as the project moves toward sustainability.



It is thus believed by the facilitators of this recent curriculum review process that the IMPACT project curriculum development and refinement process is well on track for ending this shared journey as a promising national model. Progress to date on the project and its challenging curriculum has been encouraging. The external facilitators applaud the strong curriculum efforts that have been undertaken and that continue to be underway in the project, and we look forward to continuing to assist as desired as the project moves toward institutional sustainability.

*Submitted by:*  
*Dr. Neal Grandgenett*  
*Dr. Elliott Ostler*

## **Appendices:**

As detailed in the report, several appendices are included for reference. These appendices include the following:

- Appendix 1: Curriculum Review Definitions
- Appendix 2: Curriculum Review Checklist
- Appendix 3: Curriculum Review References

## Appendix 1: Curriculum Review Process Definitions (From Iowa State)

The following is the curriculum definitions, which were developed by Iowa State University, and used to support the IMPACT curriculum review process.

### Curriculum Review Process Definitions – ISU Extension and Outreach

**Program:**

A coordinated set of learning experiences designed to achieve predetermined outcomes. Programs follow a continuum – starting with an initial environmental scanning, followed by application of the learning experiences, and resulting in changes in knowledge, behavior, and condition (as stated in the ISUEO program development process).

**Program Review:**

The assessment of the program environmental scanning process, program development, and reporting impacts. A review includes an assessment of how the program will be evaluated to determine what it has achieved.

**Curriculum:**

A group of planned educational offerings including materials, exercises, and activities intended to create a change in knowledge, behavior, or action

**Curriculum Review:**

Evaluation of educational offerings, delivery, and evaluation of those activities designed for a specific audience to maintain consistent standards of quality and credibility

**Peer Review:**

A process conducted by colleagues knowledgeable in the content and educational practices to assess subject matter and curriculum or program quality

**Evidence-Based:**

Programs that have been found to be effective based on the results of rigorous evaluations (What Works, Wisconsin, Small et al.)

**Evidence-Informed:**

Research-based principles of program effectiveness are incorporated into current programs (Small, Cooney and Connor)

**Best Practices:**

Activities and behaviors that work most effectively, informed by research and experience

**Research-Based:**

Careful study of a given subject, field, or problem undertaken to discover facts or principles

**Information:**

The communication of facts, data, or evidence

**Information Checking:**

Reviewing documents for errors, accuracy, and format of data being presented

## Appendix 2: Curriculum Review Checklist

The following curriculum review checklist, as developed by Iowa State University, was the basis of the focus group conversation on the IMPACT curriculum.

### Curriculum Review Checklist – ISU Extension and Outreach

#### Procedural

- Meets the curriculum definition. (See Curriculum Review Definitions.)
- Curriculum goals match program goals and ISU Extension and Outreach's mission.

#### Content

- Information and materials are research-based.
- Curriculum is sponsored by, or approved by, a land-grant university or other reputable institution. Examples include: Federal and State agencies (USDA, DOE, HHS, Commerce, etc.) and non-Land Grant public universities.
- Intended curriculum outcomes focus on positive behavior changes leading to economic, environmental, civic, and/or social conditions.
- Non-original content is clearly and appropriately cited.

#### Readability

- Training materials and facilitator/instructor notes included.
- Teaching materials match intended facilitator/instructor knowledge and teaching skills while addressing specified learning objectives.
- Learning objectives are clearly stated and are developmentally appropriate.

#### Utility

- Curriculum has been piloted or previously used with clientele in a relevant context.
- Curriculum is learner centered.
- Learner materials are culturally appropriate.
- Educational, hands-on activities accommodate different learning styles.
- Intended curriculum audience has been involved in developing or shaping the curriculum.

#### Evaluation

- Program evaluation methodology and outcome evaluation tools and processes are included.
- Curriculum outcomes are realistic for the audience and context.
- Information and activities are easily replicable.
- Information and activities are easily adapted for changes in types of learners, learning environments, scope of educational learning experience, etc.

### Appendix 3: Curriculum-Related Review Process References

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