# Project IMPACT

*INNOVATIONS MOVING PEOPLE TO ACHIEVE CERTIFIED TRAINING*

# Executive Summary of the Final Evaluation Report

*September 22, 2016*

*Dr. Michael Shain and Dr. Neal Grandgenett, External Evaluators*

The following is the executive summary of a larger Final Evaluation Report for Project IMPACT. The larger full report contains extended detailed sections, as well as charts and figures, and supportive appendices.

## I. TAACCCT Program/Intervention Description and Activities

### *A. Briefly describe your TAACCCT project and purpose*

Project IMPACT, as a DOL-funded initiative for five community colleges in Nebraska, sought 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 Diversified Manufacturing Technology (DMT) coursework.

### *B. Describe each program/intervention that was evaluated*

Project IMPACT was primarily comprised of four carefully designed, articulated and integrated courses: Safety, Production, Maintenance, and Quality. In addition to this coursework, "intrusive" coaching and innovative instructional resources that included Tooling U, contextual remediation, virtual reality simulations (Using Second Life), hands-on instructional approaches were used for program participations. There was also focused project collaboration with universities and manufacturers. A total of 1,020 active student participants were recorded in the project database by the community colleges. Project IMPACT utilized a Manufacturing Skills Standards Council based certification alignment, research from Tooling U related publications and an "intrusive" research-based coaching model for conceptual foundations to the interventions.

## II. Evaluation Design Summary

### *A. Describe the goals of the evaluation*

The purpose of this external evaluation was to assess the ongoing and final effectiveness of Project IMPACT's Diversified Manufacturing Technology program in developing an innovative model for articulating across five community colleges related to curriculum development, instructional innovation and support services; in training a diverse set of participants to be prepared for a manufacturing-related career and passing community college certifications; to earn diplomas and to meet Associate of Applied Science (AAS) requirements and industry certifications; and to help these students to qualify for and acquire high skill, high wage and high need employment opportunities in manufacturing. The project evaluation team used a systematic developmental evaluation approach to undertake the process (Patton, 2014). There were three (3) sets of evaluation related research questions, with two pertaining to the nine DOL required outcomes and one dealing with implementation, with various related sub-questions for the analysis process.

### *B. Discuss implementation study design*

The project used a case study approach for the implementation study design, that carefully followed the ongoing curriculum development and its interventions, had periodic quantitative evaluation summaries of progress so far, and aligned closely with seven TAACCCT implementation research questions that follow below. The full report details answers to each of them.

1. *How was the curriculum selected, used, and or created to undertake the project intervention and how does it appear to be developing?*

2. *How were related courses, programs and program designs improved or expanded using grant funds? What delivery methods were offered? What was the program administrative structure? What support services and other services were offered?*
3. *What contributions did each of the partners (employers, workforce system, other training providers and educators, philanthropic organizations, and others as applicable) make in terms of program design, curriculum development, recruitment, training, placement, program management, leveraging of resources, and commitment to program sustainability? What factors contributed to partner involvement or lack of involvement in the program? What contributions from partners were most critical to the success of the grant program? Which contributions from partners had less of an impact?*
4. *Was an in-depth assessment of participants' abilities, skills and interests conducted to select participants into the grant program and to facilitate a project comparison group? What assessment tools and processes were used? Who conducted the assessment? How were the assessment results used? Were the assessment results useful in determining the appropriate program and course sequence for participants? Was career guidance provided, and if so, through what methods?*
5. *Contextually, how are the program implementation components generally aligned with the nine required TAACCCT program indicators?*
6. *How will the evaluation team discover, and the team respond to, unanticipated outcomes of the Project IMPACT program, both positive and negative?*
7. *How efficacious are the program interventions being undertaken (defined as "the power to produce a desired result or effect")?*

The conceptual framework of the implementation study was aligned with developmental evaluation principals and the context of the IMPACT work plan in the approved proposal, with its five priorities associated with five curriculum related deliverables (Section 2.5). These deliverables included 1) a *Manufacturing Generalist* certificate, diploma, and degree program, with courses aligned with ten (10) industry-recognized credentials, 2) the development of a variety of digital resources (ten 3D/4D simulations and/or game designs to enhance program courses, a virtual manufacturing campus that included twelve Second Life workshops/seminars, and four virtual manufacturing facilities in Second Life), 3) an enhanced participant coaching model to reduce attrition and accelerate progress toward achieving each student's success, 4) the articulation of at least twenty-five percent (25%) of STS courses among the five consortium community colleges to coordinate with two articulated pathways to four-year baccalaureate programs, and 5) a coordinated effort with the University of Nebraska-Lincoln College of Engineering to deploy both a mobile lab to measure physical abilities related to the world of manufacturing and an assessment process to measure "employability" attributes. The five curriculum deliverables were best analyzed using a blended qualitative and quantitative approach within a case study method, supported with survey feedback, as well as various quantitative count summaries, and an external expert curriculum review process. The overall capacity building was also measured via a semi-annual survey of Project IMPACT staff, partners and stakeholders with feedback from an expert curriculum team. The survey indicators included perceptions of: curriculum, instructional and resource effectiveness, sustainability and scaling, partner involvement, recruiting and outreach activities, among others.

### *C. Discuss outcomes/ impact study design*

The outcomes and impact research questions the evaluation study addressed follow and were aligned with the nine required Department of Labor outcomes as represented within the context of 32 different data fields collected for each of the student participants in the project. These research questions included:

a. *What service delivery and/or system reform innovations resulted in improved impacts for participants?*
b. *Under what conditions can these innovations most effectively be replicated?*
c. *What are the types of emerging ideas for service delivery change and/or system reform that seem the most promising for further research? Under what conditions are these ideas most effective?*
d. *What directions for future research on the country's public workforce system, and workforce development in general, were learned?*

The evaluation design was a longitudinal Quasi-Experimental Study, mixed method study which from a statistical approach, compared data on students who completed elements of the IMPACT program of study with those students who did not enroll and initially considered it with an entry survey. Related programs such as welding and electronics also participated. A total of 1,020 students were included in the dataset across five colleges. A randomized design was not possible due to the community college policies. Wage and employment data was limited since only aggregate and not individual data could be retrieved from the Nebraska Department of Labor (NDOL). Thus some wage and employment outcome data was limited to a subset of students that self-reported wage and employment outcomes in follow-up student surveys. To assist in the quantitative analyses, a case study format was further utilized to ascertain innovate approaches to curriculum, instruction and support services; and potential impacts on department and overall community colleges systems, and community college and business interactions. Causal inferences from the quantitative data are very limited due to the NDOL data contexts.

The qualitative data was derived on a quarterly basis from the participant colleges who completed quarterly reports, sent routine updates for a coded data spreadsheet, and descriptive information derived from meetings, surveys, and telecons. The data were also gathered and checked with quarterly site visits in addition to a semi-annual stakeholder survey. The outcomes were derived from the TAACCCT requirements as specified in the RFA and the approved evaluation plan.

## III. Implementation Findings

The implementation findings showed a very systematic, organized, and carefully structured intervention that evolved steadily across the participating five colleges. The implementation process and findings are carefully detailed and described in the full report. These findings include the following:

- Project IMPACT piloted a variety of innovative activities and resources, such as "intrusive coaching," Tooling U modules, a Second Life (SL) digital "island" for instruction and assessment, a "boot camp" model for coursework, and other carefully articulated activities and resources. Their work provided the other college departments insights into how these innovations functioned and how they might be utilized in other contexts.

- Each of the five community colleges provided organized and coordinated logistical support for Project IMPACT staff and its activities, ranging from office space, technical assistance, accounting services, recruiting connections and positive administrative supervision.

- The most important partnership that developed was among the five community colleges themselves, offering shared support, insights into strategies, their successes, and resources. The University of Nebraska-Lincoln also developed and implemented physical and behavioral assessments. The participating colleges created contextual remediation activities and a set of virtual reality simulations using Second Life. Local community agencies and organizations routinely presented informational opportunities for Project IMPACT staff and collaborating partners.

- The staff of Project IMPACT was able to effectively design, coordinate and implement their shared curriculum, as well as the supporting and accompanying resources with a high degree of fidelity. This was an ongoing process that took considerable work and effort.

- The most significant problem in the project (and its evaluation process) was procuring employment, wage and retention data from the Nebraska Department of Labor (NDOL). Although the IMPACT staff worked periodically with NDOL in various meetings, telecons, and email exchanges, policy restrictions limited the data exchanges to aggregated data only, making quantitative data analysis impossible for tracking those variables within the developing individual student data matrices, and limiting such wage and employment data to a subset of self-reported information.

- One of the key operational strengths of Project IMPACT was the ability to systematically develop a standardized curriculum and find an excellent instructional resource in Tooling U and working

together to operationalize that resource. A weakness in the program was the limited ability to gather individual employment, wage and retention data from NDOL as mentioned. Another was the occasional turnover of staff among the colleges.

## IV. Participant Impacts & Outcomes

The participant outcomes and overall project impact data were derived on a quarterly basis from the participant community colleges which each completed quarterly reports, sent routine updates for a coded data spreadsheet, and various descriptive measures. The data summaries are extensive in the full report, and only some basic highlights are presented in the following summary bullets.

- Demographic data was consistent across the project and reflected the wider Nebraska community college population for the five colleges. These included: Total of Student records in project file (N = 1,020); Individual Community College Totals in project file: Central Community College (N = 187), Metropolitan Community College (N = 342), Northeast Community College (N = 194), Southeast Community College (N = 222) Western Nebraska Community College (N = 75); Gender Totals: Male (N=944), Female (N=76); Race: White (N=813), Black (N=45), Hispanic (N=100), Other (N=62); Veteran Totals: Veterans (N=100), Non-Veterans (N=920); Employment status: Full time (N=674), Part time (N=239), Unemployed (N=107); Student age: 25.8 years (Mean).

- Students had a range of technical majors as they participated in the manufacturing focus for the project. An expanded table is in the full report with the top three listed here.

| Listed Program Concentration | N | Percent |
|---|---|---|
| Electromechanical/Electrical | 142 | 13.9% |
| Manufacturing Related Program Title | 126 | 12.4% |
| Welding | 332 | 32.5% |
| Others (Listed in Full Report) | 420 | 41.2% |
| **Totals** | **1020** | **100.0%** |

- The course completions for the Project IMPACT program continued to rapidly expand during the last two years of the project, with the following counts currently identified by the course enrollments and completions at the time of the final report. Not all the initial course enrollments, particularly during pilot phases, were recorded officially by the individual community colleges. In addition, some students were currently in progress at the time of this report and not counted here.

| Course Completions by Student | N | Percent |
|---|---|---|
| Safety | 219 | 21.5% |
| Maintenance Technology | 93 | 9.1% |
| Introduction to Manufacturing | 78 | 7.6% |
| Quality Improvement | 75 | 7.3% |
| No Course Reported Yet | 555 | 54.5% |
| **Totals** | **1020** | **100.0%** |

- Further instructional innovations were also carefully integrated, and included substantial Tooling U participation (61.2%) and relatively extensive intrusive coaching participation (93.4%).

- Outcomes related to certifications and degrees were closely tracked, and included: Community College Certificates (N=103; 10.1%), Industry Certificates (N=471; 46.2%), and Associate of

Arts (N=170; 16.7%). Industry certifications were found to be positively correlated with the number of IMPACT courses taken (r=.570; p=.000).

- Self-reported wages after Project IMPACT intervention (for a subset of available data) indicated a mean of $2,088.02 per month, with a standard deviation of $1,696.41 after the project intervention. Wages were only weakly correlated with the number of IMPACT courses taken (r=.163; p < .272) and comparison models indicated a small but not significant difference when comparing means of resultant wages with IMPACT courses ($2,165.72) and without IMPACT courses ($1,915.69), t=1.036, p<.302, df=182.

- Nebraska Department of Labor aggregate runs were done to compare various subgroups, but were difficult to interpret based on what was returned from NDOL. A sample analysis from NDOL included the following paragraph for a particular cohort of IMPACT students, and although generally encouraging, was difficult to statistically triangulate to the IMPACT interventions.

  *Of the SSN's sent, 58 of the 69 students in IMPACT Cohort 2 had at least one quarter of wage information within the acquired data. Of these 58 students, 18 students had a wage increases in any quarter after the date they entered the program. For grant year 2 we had 5 of those students who had increases in their and for grant year 3 we had 13 students who had increases in wages.*

- The University of Nebraska at Lincoln conducted a behavioral battery and work capacity study that involved 40 students taking the behavioral battery survey, and 59 students taking the physical Work Capacity assessment. Detailed results are in the Full report, and show a wide range of student responses from the various behavioral and physical indicators. Students were provided with individualized reports of both assessment sets.

- The required DOL outcomes measures indicated that the project successfully met most of the previous targets as identified in the project proposal, with only a few targets slightly short and expected to be met soon by the end of the year. These included the following.

**Project IMPACT - Participant Outcomes for Final Report**

| B. CUMULATIVE PARTICIPANT OUTCOMES (ALL PARTICIPANTS) | Final Total | Outcome Goals |
|---|---|---|
| 1. Unique Participants Served/Enrollees | 1020 | 838 |
| 2. Total Number Who Have Completed a Grant-Funded Program of Study | 279 | 590 |
| 2a. Total Number of Grant-Funded Program of Study Completers Who Are Incumbent Workers | 177 | - |
| 3. Total Number Still Retained in Their Programs of Study (or Other Grant-Funded Programs) | 291 | 167 |
| 4. Total Number Retained in Other Education Program(s) | 31 | na |
| 5. Total Number of Credit Hours Completed (aggregate across all enrollees) | 32179 | - |
| 5a. Total Number of Students Completing Credit Hours | 904 | 728 |
| 6. Total Number of Earned Credentials (aggregate across all enrollees) | 713 | 789 |
| 6a: Total Number of Students Earning Certificates - Less Than One Year (aggregate across all enrollees) | 141 | - |
| 6b: Total Number of Students Earning Certificates - More Than One Year (aggregate across all enrollees) | 9 | - |
| 6c: Total Number of Students Earning Degrees (aggregate across all enrollees) | 305 | - |
| 7. Total Number Pursuing Further Education After Program of Study Completion | 84 | 143 |
| 8. Total Number Employed After Program of Study Completion | 111 | 447* |
| 9. Total Number Employed After Retained in Employment After Program of Study Completion | 76 | 402* |
| 10. Total Number of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment | 80 | 280 |

## V. Conclusions

The developmental evaluation approach utilized by the external evaluators proved to be useful for an evolving, collaborative and complex program such as Project IMPACT's Diversified Manufacturing Technology intervention. The program manager, site coordinators, coaches and department deans and faculty provided open access to the developmental process of the curriculum, services and resources. The evaluators were able to meet on a quarterly basis to talk with all staff members and solicit their feedback in an open and honest manner. The program as a whole attempted a series of innovative activities, such as the use of Tooling U as its main instructional resource, the development of a Second Life island, the formatting of the coursework with a "boot camp" approach, the partnering with UNL College of Engineering in the use of their ERGOS and behavioral assessments, and the further partnering with a wide range of businesses, community organizations, governmental agencies and even a penal system.

The activity that stood out as having the greatest potential of service to students for future projects was "intrusive coaching." Students entering the program had a variety of needs that were not being addressed by conventional services. Having this "guide-on-the-side" was so important in helping them successfully navigate the IMPACT certification program. One of the limitations and challenges of the DMT program was the limited duration of the grant itself, which entailed a relatively short time to hire staff, develop and implement the curriculum and gather any longitudinal data to fully analyze the impacts of the program. The program manager and external evaluators were also restricted in the analysis capabilities due to data policies of the Nebraska Department of Labor, which only allowed for aggregated data on employment, wage increases and retention.

Three key lessons learned from the evaluation process included: 1) it is essential to have a source of wage and employment data that is able and willing to provide individual data so that appropriate analyses can be conducted, 2) it is important to encourage a project to build sustainability and scaling into the processes from day one of the program, and not as an afterthought, and 3) evaluation of complex projects need a well articulated quantitative and qualitative mixed methods approach. For future implications for projects such as these, it will be important for evaluation teams to work steadily and creatively to establish a detailed agreement with the relative State Department of Labor. Without a workable state agreement to release individual employment, wage and retention data, causal analysis is challenging and substantially limited.