

Date: October 3, 2012

To: Matt Wagenheim; APRC Chair

From: Bruce Gregory; MFGE APR Chair

Subject: Responses to APRC Recommendations; Memorandum of 7 November, 2011

CC: Larry Schult, Bob Speirs, Blaine Danley, Mark Rusco, Jim Rumpf, Joe Wist

Included are responses to the four areas mentioned in the APRC Recommendation document as well as addenda regarding specific areas in the APR document requiring further clarification by the APRC.

Responses follow the original APRC Recommendation.

1) Fully evaluate the current status of their program (including a potential name change to one more in line with industry trends).

- a. After further review, this item was considered to be covered sufficiently in the original APR document.

2) Identify specific target market(s). Clarification was requested on this. The word "supply of students" could aptly be used in place of "market."

- a. Students from a variety of technical, on-campus, associate degree programs are qualified to transfer into the MFGE BS degree. Typical program areas include WELD AAS, CDTD AAS, PLTS AAS, MECH AAS, MFGT AAS. MFGE faculty are invited routinely to CDTD and MFGT programs. The other program areas have their own plus-2 BS degree and are not inclined to invite competition. Regardless, the MFGE program does attract students from the other AAS degrees.
- b. Students lacking an AAS degree who have accumulated at least 30 technical credits can transfer those credits into the program after a review by a faculty advisor. Some deficiencies may need to be made up by the student. They are fully aware of these prior to being admitted to the program. These students can originate from on or off campus.
- c. The primary feeder program for on-campus students is the MFGT program. Historically, however, students from this program constitute less than fifty percent. As the MFGT program prospers, owing to their strategic curriculum change, this percentage is suspected to increase dramatically.
- d. Non-FSU AAS degreed students transfer from community colleges all over Michigan. Articulation agreements between FSU and many Michigan community colleges have been established to aid in an efficient transfer to FSU MFGE BS program. Montcalm, Muskegon, Lansing, Grand Rapids, and Delta Community Colleges are prime sources of students transferring into the MFGE BS at both Big Rapids and Grand Rapids sites.
- e. Recruiting students to the MFGE program in Grand Rapids poses several difficulties because students are mostly working adults. There is no central point for recruitment

such as a high school or vocational center. There is no natural recruitment date such as graduation. The efforts follow two different paths.

- i. FSU-Grand Rapids partners with Grand Rapids Community College (GRCC) to host career days and education days throughout the year. Prospective students are invited to come and explore the possibilities for degrees and MFGE faculty always assist by manning the FSU booth. The events are fairly well attended and have yielded prospective students in the past. Often they are not prepared to come to FSU immediately and will spend some time at GRCC. MFGE faculty visit GRCC classes to recruit students to the FSU programs to build program awareness.
 - ii. The other avenue of recruitment is direct visits to local companies. A recruiting brochure has been developed with the assistance of the marketing staff in Grand Rapids. This brochure contains information on all of the technical degrees offered at the campus. Through telephone calls, connections through FSU grads, or from companies contacting the FSU offices these visits are arranged and completed by the MFGE faculty. A typical meeting connects us with the Human Resources department where we leave copies of the brochure.
- f. Joe Wist and Dave Borck have developed an effective recruiting strategy that targets students for both the MFGT AAS and MFGE BS programs. This is used by faculty when they visit high schools, community colleges, and career centers.
 - g. The FormulaSAE team has aided in recruiting for the College of Technology at Dawg Days, high schools, and career centers. The car and the team members are a natural draw for the students. No hard data exists regarding the effectiveness of this
 - h. Dean Krager of the MFGT faculty group has designed an elaborate trip to IMTS (International Machine Tool Show) held in Chicago every two years. The purpose is to provide high school counselors exposure to the high technology that exists in industry that is just plain COOL. Moreover, they bring their students along who are most likely to attend college. Two busses were taken to IMTS 2010. Ferris will again sponsor two busses. Since the MFGT program is a very good feeder program for the MFGE program, the MFGE program strongly supports this initiative. MFGT and MFGE students will serve as hosts to these high school students for the day.

3) Benchmark the program against successful manufacturing programs across the country.

The manufacturing engineering Technology faculty agreed that a proper benchmark would be one that compared the overall entry level performance of FSU MFGE graduates to graduates from other institutions. An instrument was prepared and sent to companies who hire Ferris graduates and graduates from other competing institutions. The research instrument appears in Appendix 1. The analysis performed by the FSU Institutional Research & Testing Center is contained in Appendix 2. What follows is the summarization of that analysis pertinent to this query.

Table 1: Schools listed as competing institutions, frequency of occurrence in responses, and the relative comparison rating frequency.

Competing Institution	Frequency	Performance FSU grads relative to competing institution grads		
		<	=	>
GVSU	5	1	3	1
Illinois Institute of Technology Chicago	1	0	1	0
Michigan Tech	1	0	1	0
Purdue University	2	0	2	0
S. Dakota School of Mines and Technology	1	1	0	0
SVSU	2	0	0	2
WMU	7	0	2	5
CMU	1	0	1	0
MSU	1	0	1	0
LSSU	1	0	1	0
Total	22	2	12	8
Proportions	100%	9.09%	54.55%	36.36%

Conclusions:

1. Ferris graduate performance is, in most cases equal to above other institutions regarding entry level performance.
2. Based on some comments, serious weaknesses exist in the MFGE Tech program. Namely, knowledge of basic LEAN principles and a basic business sense.

Recommendations:

1. Require MFGE-354 in the MFGE program. This course teaches LEAN Principles.
2. Being able to build a basic business sense could be addressed, to a small degree, in MFGE-423, Engineering Economics. It is uncertain what the respondent meant specifically with this comment. Perhaps understanding a balance sheet or income statement would do. The Industrial Advisory Committee will be questioned about this.

4) Update program progress in meeting their strategic plan as a way to improve curricular offerings.

- a. The program does not have a strategic plan per se. Aside from faculty initiatives, encouraged by Advisory Board support, micro changes are made to add/delete content as needed to remain as current as our resources allow. Examples of this include:
 - i. The addition of LEAN Principles (MFGE-354) as an elective. It may become a required course in the major. This discussion is current.
 - ii. The conversion of MFGE-324 from a Tool Engineering class into Process Planning course. The material once covered in Tool Engineering relating to the design of cutting tools is no longer necessary. While cutting tool technology is absolutely essential, the utilization of this technology requires little more than contacting a tool supplier to obtain off the shelf cutters that contain the technology in them. The theory supporting selection is all that is necessary at the college level.
 - iii. MFGE-411, Process Planning II is up for consideration as to how it might be converted into a lab based LEAN course. Though nothing is formalized in a strategic plan it is being discussed amongst the faculty. If there is a way to create hands-on exercises in LEAN for a production environment, then it will be adopted and the course outline updated.
- b. There are no plans to increase CAPS owing to limited resources. Namely, faculty and facilities. It must be understood that the MFGE program relies on others' labs and they are only available outside the curricular steward's time slots.
- c. One area being discussed that would require a strategic plan to enact is that of moving toward a full ABET accredited engineering program that does not reduce the hands on content of the current engineering technology program. The advisory board was split over whether or not this should be pursued. This action would represent a strategic shift for MFGE and for Ferris' College of Technology. This shift would be as dramatic as the shift the college made when it adopted the 2+2 model for BS degrees in engineering technology. The first graduating class was the MFGE class of 1978. The only BS degree the School of Technology (CET today) offered was in Automotive Management. This initiative could not be done without support from the college or the university. Facilities to house such a program would pose the greatest obstacle.
- d. Another area that would require a strategic plan is combining PLTS, WET, and MFGE programs and then requiring a CORE of engineering technology courses that are common and concentration courses that branch off into specifics. This is an example of an idea that is often bantered about, but would require direction from the CET Dean's Office to implement.

- 5) A current example of how micro changes are made to the program is best summarized by an email just circulated. It is evidence of a common occurrence within this faculty group and displays the professional nature of continuous improvement.

From: Jim Rumpf/FSU
To: Robert G Speirs/FSU@Ferris, Bruce M Gregory/FSU@Ferris, Mark Rusco/FSU@FERRIS, Joseph Wist/FSU@FERRIS, Blaine Danley/FSU@FERRIS, David A Borck/FSU@FERRIS, Dean Krager/FSU@FERRIS, Lou Nemastil/FSU@FERRIS
Date: 09/06/2012 02:00 AM
Subject: Thursday department meeting

Guys,

Can't be at the department meeting, but there are three things I wanted to bring up to discuss:

1) Finding a way to shoehorn MFGE 354 (Lean Manufacturing) into the MFGE juniors' spring semester. Mark and I both found this summer that our interns would benefit from more exposure to lean concepts prior to their internships.

2) Revisit the idea of making the MFGE-MFGT block schedule only have classes from Monday through Thursday. That would leave Fridays for our students to work off-campus (helping them finance their education) and would be a competitive advantage over other schools that our candidates consider. There are other advantages as well, but those are the two primary ones we've discussed.

3) Do we still want MFGE 313 (Computer Apps for Mfg Engineers) rewritten to be a 100- or 200-level course? It would take the place of ISYS 105, which seems to be almost universally considered to be worthless by our students and faculty alike.

Jim

One response to the email was:

"We could move MFGE-326 to the fall semester to make room in the spring."

Another was, "We could split the content of 326 between two existing courses. The lecture content of 324 and 411 are very appropriate places to put the material. A discussion of what to remove from 324 and 411 lecture content would be necessary."

Manufacturing Engineering Technology Academic Program Review Addenda

Section 1-A (page 5 APR)

For the benefit of the reader the FSU-MFGE Mission is restated. It is our program goal.

- 1) “The mission of the Manufacturing Engineering Technology Program is to prepare career-ready manufacturing engineering professionals to serve Michigan and the nation in a global economy.”
- 3) How do the goals apply to preparing students for careers in and meeting employer needs in the community/region/marketplace?

Original response: Placement at relatively high salaries is our ultimate goal.

Added:

Placement at relatively high salaries is our ultimate goal. The manufacturing base for Michigan, the Midwest region and beyond, require the expertise of manufacturing engineering technology graduates. As long as there is manufacturing, manufacturing engineering will be needed. All curricular decisions are driven by the question, “Does this improve graduate effectiveness?”

Section 1-B (page 6 APR)

- 1) Describe any unique features or components of the program.

Original response:

- a. Blending theory with Hands-on.

Added:

The faculty is continually seeking ways to make assignments more real. One example of this is a Junior level assignment whereby all course work, to that point in the program, is used to successfully complete a field experience. The project is provided by Amerikam, a manufacturing company located in Grand Rapids, Michigan. Students work in teams to arrive at a solution. They present that solution to Amerikam staff at Amerikam’s facility. Immediately following student presentation, students are shown the company’s solution to the same problem. A plant tour follows where students can observe the solution in action. This is just one way the manufacturing program remains current in the field. Students go to the field even before their internship experience. The full project assignment is contained in Appendix-C of the APR.

Section 1-C (page 7 APR) Program Relevance

More information was requested for this section. Apart from citing more Bureau of Labor Statistics on the topic, it can be said there is a shortage of skilled workers in the United States. While Manufacturing Engineers do not do the work of welders or machinists, they design processes and tooling that are built by those in the skilled trades. Evidence of this is found in the October 17, 2011 issue of Industry Week magazine. In it, Josh Cable cites statistics gleaned from the survey of 1,123 manufacturing executives from across the United States. The article states that 67% of these executives are, “facing moderate to severe shortages of skilled workers such as machinists, operators, distributors, and technicians.” The article goes on to state that, “as many as 600,000 skilled manufacturing positions in the United States are unfilled due to the nagging shortage of qualified workers...” While these positions will not be filled by MFGE students, the shortage represents, indirectly, the general shortage of people who have the technical skills and knowledge that Manufacturing Engineering Technologists have.

Section 1-D (page 10 APR)

- 3) What is the assessment of program personnel of the value of the program to employers? Explain how this value is determined.

Original response: N/A; did not collect data for this.

Added:

Faculty perceptions of the program survey located in Section 2-E of the APR document answer the question implicitly by a show of support (100%) for both the missions of the University and Manufacturing Engineering Technology program.

Mission of the University:

“Ferris State will be a national leader in providing opportunities for innovative teaching and learning in career-oriented, technological and professional education.”

Mission of the MFGE program:

“The mission of the Manufacturing Engineering Technology Program is to prepare career-ready manufacturing engineering professionals to serve Michigan and the nation in a global economy.”

Section 3-G (page 51 APR)

7) What effects have actions described in (5) and (6) had on the quality of teaching and learning in the program?

a) This was left blank

Added:

It is unknown what the effects are since there is not a control group to contrast performance of current students against. It does seem reasonable to conclude, however anecdotal, that team assignments, involvement with professional organizations, and interactions with faculty during advising all play a role in student success.

Appendices

Benchmarking MFGE-FSU Graduate Performance Instrument	.	.	A-1
MFGE APR...Employer Benchmarking Study (Frequencies).	.	.	A-2
Benchmarking Cross Tab Analysis	.	.	A-3

Appendix A-1

Benchmarking Instrument



FERRIS STATE UNIVERSITY
Imagine More

Manufacturing Engineering Technology APR Employer Benchmark Survey

Please take a few moments and evaluate FSU graduates or interns your company has hired relative to graduates or interns from other institutions. We are interested in entry level performance only. Moreover, we are considering overall performance alone. Add comments as you wish. Please complete the survey by September 28, 2012.

Instructions: Print the name of the competing institution on the blank provided. If OVERALL performance of FSU MFGTE Interns or graduates is below that of the competing institution select Poorer Than; if the same, select Equal To; if above, select Better Than. The first line is an example and does not pertain to football! If you don't have as many graduates from competing institutions in your company, only use as many as you need.

1. Name of Competing Institution

2. Level of overall performance of FSU graduates compared to those employees from the above institution.

- Poorer Than
 Equal To
 Better Than

3. Please use this space to make comments on the above comparison.

4. Name of Competing Institution

5. Level of overall performance of FSU graduates compared to those employees from the above institution.

- Poorer Than
 Equal To
 Better Than

6. Please use this space to make comments on the above comparison.

7. Name of Competing Institution

8. Level of overall performance of FSU graduates compared to those employees from the above institution.

- Poorer Than
 Equal To
 Better Than

9. Please use this space to make comments on the above comparison.

10. Name of Competing Institution

11. Level of overall performance of FSU graduates compared to those employees from the above institution.

- Poorer Than
 Equal To
 Better Than

12. Please use this space to make comments on the above comparison.

13. Your Company Name:

14. Your Position/Title:

15. Your Alma Mater, if you are a college graduate:

16. Please use this space for any additional comments or suggestions.

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Thank you for your time and inp

Appendix A-2

MFGE APR...Employer Benchmarking Study

Frequencies

Prepared by: Institutional Research & Testing, 09/12

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing			
q1 Name of Competing Institution	9	0			
q2 Level of overall performance	9	0	1.89	2.00	.601
q3 Comments on q2	9	0			
q4 Name of Competing Institution	9	0			
q5 Level of overall performance	7	2	2.71	3.00	.488
q6 Comments on q5	9	0			
q7 Name of Competing Institution	9	0			
q8 Level of overall performance	3	6	2.00	2.00	.000
q9 Comments on q7	9	0			
q10 Name of Competing Institution	9	0			
q11 Level of overall performance	1	8	2.00	2.00	
q12 Comments on q11	9	0			
q13 Your Company Name	9	0			
q14 Your Position/Title	9	0			
q15 Your Alma Mater	9	0			

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing			
q1 Name of Competing Institution	9	0			
q2 Level of overall performance	9	0	1.89	2.00	.601
q3 Comments on q2	9	0			
q4 Name of Competing Institution	9	0			
q5 Level of overall performance	7	2	2.71	3.00	.488
q6 Comments on q5	9	0			
q7 Name of Competing Institution	9	0			
q8 Level of overall performance	3	6	2.00	2.00	.000
q9 Comments on q7	9	0			
q10 Name of Competing Institution	9	0			
q11 Level of overall performance	1	8	2.00	2.00	
q12 Comments on q11	9	0			
q13 Your Company Name	9	0			
q14 Your Position/Title	9	0			
q15 Your Alma Mater	9	0			
q16 Additional comments/suggestions	9	0			

Frequency Table

q1 Name of Competing Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	GVSU	5	55.6	55.6	55.6
	Illinois Institute of Technology Chicago	1	11.1	11.1	66.7
	Michigan Tech	1	11.1	11.1	77.8
	Purdue University	1	11.1	11.1	88.9
	South Dakota School of Mines and Technology	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q2 Level of overall performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poorer Than	2	22.2	22.2	22.2
	Equal To	6	66.7	66.7	88.9
	Better Than	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q3 Comments on q2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	11.1	11.1	11.1
	FSU - Better at hands on problem solving (may be the type of student FSU attracts vs GVSU)	1	11.1	11.1	22.2
	FSU graduates are more prepared to hands on work and apply there education.	1	11.1	11.1	33.3
	FSU students are less technical than MTU, better at hands on	1	11.1	11.1	44.4

	<p>GVSU does a better job working with local employers, to expose their students to future job opportunities. GVSU also has been much more willing to work with our company in solving Mfg issues that we have experienced. When reaching out to my Alma Mater, FSU, I was informed that due to recent legal complications the college is no longer able to support local businesses. Businesses often have issues that are scoped perfectly for college students to take on and try to solve. It gives the students some real world experience and exposes local businesses to FSU's programs and students coming out of their programs. In addition the faculties have a deep understanding of their body of knowledge and can be very use full to business from a consulting point of view. FSU graduates have a much better understanding/knowledge base of the Quality Curriculum, which is very important. Would like to see both schools incorporate more Lean tools (i.e. VSM, Kanbans, Line Ba lancing, 6S...) within their curriculums. Very discouraging when graduates coming into the work force, straight out of school, do not even understand Lean terminology. I also feel that an emphasis on financial analysis would be beneficial. I have often seen Mfg Engineering who struggles to be able to clearly communicate why the solution they are purposing makes the most business sense. Students can often communicate the need from a Mfg/Technology standpoint, but Senior management is not as interested in understanding the Mfg/Tech portion of a decision as the financial impact to the business.</p>	1	11.1	11.1	55.6
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	GVSU students receive theoretical training and it's difficult for them to apply what they've learned in a actual work environment.	1	11.1	11.1	66.7
	I have considerable respect for your institution and the student we had at our facility. Both of the students were very sharp, very good at applying the knowledge they had acquired in their studies. I base my rating on the breadth of knowledge and functionality of the information that was needed in the assigned projects and as it culminated in the preparations for the final presentation. Some of this, I would attribute to the amazing focus I believe FSU seems to have with the curriculum and at times a lack of breadth courses required in the program. This is a double-edged sword, as I there were items that our FSU student knew well above and beyond entry level, and yet not functional on something that may be rather entry level such as general business that could have been taught in classes. I must also say we were extremely fortunate to have the two young ladies at our facility - both will be hired within our company and I am very happy to say they are on our team . Your representative was not high maintenance and we all enjoyed getting to know her and having the opportunity to work with her.	1	11.1	11.1	77.8
	In hands on practical skills the students from Ferris were able to accomplish shop floor manufacturing engineering better then students studying mechanical engineerings. Issue with a lot of current students is they are depending on email and phones vs. face to face conversations.	1	11.1	11.1	88.9

	Students from both schools are at equal levels of knowledge in problem solving skills	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q4 Name of Competing Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	33.3	33.3	33.3
	SVSU	2	22.2	22.2	55.6
	WMU	4	44.4	44.4	100.0
	Total	9	100.0	100.0	

q5 Level of overall performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Equal To	2	22.2	28.6	28.6
	Better Than	5	55.6	71.4	100.0
	Total	7	77.8	100.0	
Missing	System	2	22.2		
Total		9	100.0		

q6 Comments on q5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	44.4	44.4	44.4
	Better technical and better hands on	1	11.1	11.1	55.6
	Ferris students are better prepared to handle the challenges of manufacturing	1	11.1	11.1	66.7
	FSU - Better focus on manufacturing processes (WMU more focus on mechanical and design)	1	11.1	11.1	77.8
	FSU graduates are more prepared to hands on work and apply there education. western students are more theory based. Are more advanced in design and FEA.	1	11.1	11.1	88.9
	The students from Ferris were able to be more independent and work with less instructions on projects.	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q7 Name of Competing Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	66.7	66.7	66.7
	CMU	1	11.1	11.1	77.8
	MSU	1	11.1	11.1	88.9
	Purdue	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q8 Level of overall performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Equal To	3	33.3	100.0	100.0
Missing	System	6	66.7		
Total		9	100.0		

q9 Comments on q7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		7	77.8	77.8	77.8
	Each school prepares students	1	11.1	11.1	88.9
	We had some very strong students from Purdue this year, FSU students were comparable in hands on.	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q10 Name of Competing Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		8	88.9	88.9	88.9
	LSSU	1	11.1	11.1	100.0

q10 Name of Competing Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		8	88.9	88.9	88.9
	LSSU	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q11 Level of overall performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Equal To	1	11.1	100.0	100.0
Missing	System	8	88.9		
Total		9	100.0		

q12 Comments on q11

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		8	88.9	88.9	88.9
	Equal to both are very hands on	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q13 Your Company Name

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	11.1	11.1	11.1
	Amerikam	1	11.1	11.1	22.2
	Autocam Corporation	1	11.1	11.1	33.3
	Brunswick Corporation	1	11.1	11.1	44.4
	Hilite International	1	11.1	11.1	55.6
	John Deere	1	11.1	11.1	66.7
	Nexteer Automotive	2	22.2	22.2	88.9
	Wacker Neuson Corporation	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q14 Your Position/Title

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	11.1	11.1	11.1
	Director of Operations	1	11.1	11.1	22.2
	Global General Director Of Lean Manufacturing	1	11.1	11.1	33.3
	Industrial Engineer/ CI Administrator	1	11.1	11.1	44.4

	Manager/Development Center for Manufacturing Excellence (Lean Manufacturing)	1	11.1	11.1	55.6
	Manufacturing / Facility Engineer	1	11.1	11.1	66.7
	Mark Herman / Senior Manufacturing Engineer	1	11.1	11.1	77.8
	President and CEO	1	11.1	11.1	88.9
	Technical and Quality Director	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q15 Your Alma Mater

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	11.1	11.1	11.1
	FSU	4	44.4	44.4	55.6
	FSU/Northwestern University	1	11.1	11.1	66.7
	Kent State University	1	11.1	11.1	77.8
	North Dakota State University	1	11.1	11.1	88.9
	Northwood University	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

q16 Additional comments/suggestions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	55.6	55.6	55.6
	Ferris State University Students bring a real world perspective and applied learning that launches them into the workplace with a strong foundation. They are a cut above the rest.	1	11.1	11.1	66.7
	Ferris students are better at handling hands activities than other students	1	11.1	11.1	77.8
	Keep your training relevant.	1	11.1	11.1	88.9
	Our FSU students are desired for their technical capabilities, we use them for many problems and they fit our plant MFG staffs very well.	1	11.1	11.1	100.0
	Total	9	100.0	100.0	

Appendix A-3

MFGE APR...Employer Benchmarking of FSU Graduates Relative to Competing Institutions

Crosstabs: Table 1 was developed from this data

Prepared by: Institutional Research & Testing, 09/12

q1 Name of Competing Institution * q2 Level of overall performance Crosstabulation

Count

		q2 Level of overall performance	
		Poorer Than	Equal To
q1 Competing Institution	GVSU	1	3
	Illinois Institute of Technology Chicago	0	1
	Michigan Tech	0	1
	Purdue University	0	1
	South Dakota School of Mines and Technology	1	0
Total		2	6

q1 Name of Competing Institution * q2 Level of overall performance Crosstabulation

Count

		q2 Level of overall performance	
		Better Than	Total
q1 Competing Institution	GVSU	1	5
	Illinois Institute of Technology Chicago	0	1
	Michigan Tech	0	1
	Purdue University	0	1
	South Dakota School of Mines and Technology	0	1
Total		1	9

q4 Name of Competing Institution * q5 Level of overall performance Crosstabulation

Count

		q5 Level of overall performance		Total
		Equal To	Better Than	
q4 Competing Institution		1	0	1
	SVSU	0	2	2
	WMU	1	3	4
Total		2	5	7

q7 Name of Competing Institution * q8 Level of overall performance Crosstabulation

Count

		q8 Level of overall performance
		Equal To
q7 Name of Competing Institution	CMU	1
	MSU	1
	Purdue	1
Total		3

**q7 Name of Competing Institution * q8 Level of overall performance
Crosstabulation**

Count

		Total
q7 Name of Competing Institution	CMU	1
	MSU	1
	Purdue	1
Total		3

q10 Name of Competing Institution * q11 Level of overall performance Crosstabulation

Count

		q11 Level of overall performance
		Equal To
q10 Name of Competing Institution	LSSU	1
Total		1

q10 Name of Competing Institution * q11 Level of overall performance Crosstabulation

Count

		Total
q10 Name of Competing Institution	LSSU	1
Total		1