Faculty Compensation: Competitive (Market) Pay Survey Results of Midwestern United States Industrial Technology and Engineering Technology College and University Programs

By Dr. Jeffrey M. Ulmer, Dr. Scott Wilson, and Dr. John Sutton

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Faculty Compensation: Competitive (Market) Pay Survey Results of Midwestern United States Industrial Technology and Engineering Technology College and University Programs

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ABSTRACT
A random group of seventeen National Association of Industrial Technology affiliated Midwestern colleges and universities as surveyed to determine competitive (market) pay salary levels and to obtain concepts for funding faculty salary increases for individuals in Industrial Technology and Engineering Technology programs. Salary levels were evaluated and it was determined that only the full professor rank obtained a statistical significance of $p = .004$ when a one-way ANOVA test was conducted between institutions who use competitive pay against those who do not. Principle funding methods included unionization of faculty, legislative action, tuition increases, and tying applied technology and engineering programs for competitive pay benchmarking to organizations such as AAUP, ASEE, CUPA-HR, and NAIT.

INTRODUCTION
College and university faculty choose education careers for many reasons. One often stated reason is to advance student understanding and success in applied technology and engineering fields. Once a core subject has been mastered by a faculty member, an attempt is usually made to secure a position in an educational institution where both academic competency and appropriate compensation can be acquired. But if one of these two mandates is missing, the potential faculty member may need to determine if one or the other is of more importance to their individual situation. In some cases, an experienced individual may be willing to work at a lower salary provided that an institution possesses adequate academic credentials. Unfortunately this could lead to dissatisfaction as detailed by the Herzberg Motivation-Hygiene Theory (NetMBA, 2007). Likewise, an institution may be willing to offer a contract-only or tenure-track position to an inexperienced candidate due to low salary expectations on the part of the candidate. However, once the individual acquires a few years of experience, the now-experienced faculty member may be able to land a job at an institution that offers competitive pay along with the expected academic competency.

This study was conducted to provide academics with an insight on competitive pay (also called market pay) for Industrial Technology and Engineering Technology faculty. Through a brief literature review on competitive pay, compensation currently paid to educators, and Midwestern education institution survey results (10 out 17 responded), insight is provided for potential improvement in meeting the compensation needs of our applied technology and engineering technology faculty. University of Central Missouri competitive pay institutional data was provided as a reference benchmark.
Competitive pay benchmarks base salary of comparable companies (or institutions), highlighting compensation in similar industrial positions or ranks in academia. The goal of this benchmark is to facilitate the hiring and retention of the most qualified and talented employee possible. Competitive pay sets the baseline and stage for prospective employee negotiations.

Competitive pay is yet another important factor when educational institutions seek to recruit industrial individuals to teach. Lunt (2004, ¶ 6) reports that “American Society for Engineering Education (ASEE) reveal that salaries for faculty with significant professional and academic experience are very similar to entry-level industry salaries received by four-year engineering technology graduates.” This is yet another reason to provide salaries that recruit and retain qualified faculty in high technology programs; programs such as Industrial Technology and Engineering Technology.

The National Association of Industrial Technology (NAIT) defines industrial technology as “a field of study designed to prepare technical and/or technical management oriented professionals for employment in business, industry, education, and government” (NAIT Definition, 2008, ¶ 1).

The American Society for Engineering Education (ASEE) defines engineering technology as “the profession in which a knowledge of mathematics and natural sciences gained by higher education, experience, and practice devoted primarily to the implementation and extension of existing technology for the benefit of humanity” (ASEE Definition, 2008, ¶ 1).

While the Accrediting Board for Engineering and Technology – Technology Accreditation Commission (ABET-TAC) creates and controls accrediting guidelines for primarily Engineering Technology programs, a reference is given to the blurred line between Industrial Technology and Engineering Technology programs:

TAC – Programs accredited by TAC are technological in nature and are in the broad area of technical education between engineering and vocational education/industrial technology. Briefly, the differences between educational programs in engineering technology and industrial technology include type of faculty, use of facilities, mathematics and science sequence content, and degree of specialization. More faculty members with professional education backgrounds appear to staff the present Industrial Technology programs, whereas a larger number with engineering or technological backgrounds staff the engineering technology programs (ABET, 2008, p. 3).

By this statement, ABET-TAC helps to refine the differences between Industrial Technology and Engineering Technology programs yet more specific definition is required.

Historically NAIT has promoted technology in business, industry, education, and government; provided certification opportunities for industrial technologists; and facilitated continued professional development for their members (DeRuntz & Meier, 2004). NAIT’s role in meeting the needs of industrial technologists is also becoming more blurred with engineering technology when you consider that NAIT is considering a name change to The Association of Technology, Management, and Applied Engineering (ATMAE). One reason this name change is being considered by NAIT is to better serve educators and industrial professionals who align their professional alliances with engineering technology over that of industrial technology (“NAIT Name Change,” 2008).

Zargari and Coddington (1999) assert that industrial technology demands in the United States requires qualified faculty who can prepare students for high technology careers. In a study conducted by Callahan, Jones, and Smith (2008, p. 5), technologists and engineers listed “lean process improvement, CAD/CAM, flexible manufacturing, integrated manufacturing systems, six sigma, and automation” as their top usage technologies. This takes into account the promotion and advancement of these technologies in United States manufacturing, “to remain globally competitive, education and workforce training strategies must be at the top of the national priority list” (J. Shen, D.Dunn, & Y. Shen, 2007, p. 7). Therefore, for United States higher education institutions to retain technically competent faculty with a wide range of advanced manufacturing skills, educational institutions need to implement hiring strategies that keep up with competitive pay for Industrial Technology and Engineering Technology faculty.

Table 1 provides mean salary comparisons for NAIT in 2006 (non-administrative faculty for 9-10 months; 84% return rate; 550 faculty responding); NAIT in 2007-08 (non-administrative faculty for 9-12 months; 75% return rate; 350 faculty members); American Association of University Professors (AAUP) in 2007-08 (includes Category IIA Master’s salaries for the West North Central Region – Includes Missouri); and the College and University Professional Association for Human Resources (CUPA-HR) in 2007-08 (9-10 month full-time contracts; 838 institutions [499 private, 339 public]; 211,424 faculty members) for Engineering Technologies / Technicians (Higher Ed Jobs, 2008). In none of the previous sources is there any distinction between terminal / non-terminal degree status salary levels. Lastly, Table 1 lists the fall 2008 average base pay for University of Central Missouri faculty in both terminal and non-terminal degree faculty salary. Both the NAIT 2006 and NAIT 2007-08 data are listed due the presence of differing time spans; resulting in a question if faculty were on 9 or 12 month contracts.

Table 2 lists the baseline mean salary for NAIT in 2007-08 (non-administrative faculty for 9-12 months) in comparison to the fall 2008 mean base pay for University of Central Missouri fac-
ulty in both terminal and non-terminal degree faculty salary.

The University of Central Missouri awards market pay based upon prevailing market conditions and not upon performance or merit. Equivalent programs at peer institutions with the Midwestern United States form the foundation of market pay adjustments (UCM, July 2008), although recently market pay adjustment for Engineering Technology program faculty was justified by a thorough analysis of the UCM Fall 2008 Faculty Salary Model to that of CUPA-HR and NAIT. NAIT was chosen as the yearly-adjusted benchmark for Engineering Technology faculty members. The Engineering Technology program was able to gain market pay status when it was noted that tenure and tenure-track faculty were leaving UCM due to a 10-25% differential in starting salary at other peer institutions possessing similar Engineering Technology programs ("UCM – Approved Market Disciplines," 2008).

The current UCM compensation model is the result of state funding cutbacks, placing Missouri at the 47th ranking in higher education per capita ("UCM Impact," 2007, p. 16). Per Podolefsky (2008), in 1980 "the percentage of college expenses paid by the state was 81.6 percent. This fiscal year, the state’s share is 46 percent. The result is higher tuition for students.” Due to this fact, “implementation of a market-driven compensation plan has also been delayed due to funding costs” ("Presidential Update," December 16, 2008, p. 6). Furthermore, in fiscal year 2009, UCM received $59.7 million. Fiscal year 2010 may be worse if the Missouri General Assembly’s predictions of reduced tax revenue become true. Based upon the Assembly’s request, UCM’s operating fund in 2010 could be reduced by 15 percent ($7.96 million), 20 percent ($10.6 million), or potentially 25 percent ($13.26 million) ("Presidential Update," December 16, 2008, p. 2).

The UCM market pay frequently-asked-question section posed the

<table>
<thead>
<tr>
<th>Table 2. Faculty Compensation Differentials – Means Listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank</td>
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<tr>
<td>----------------</td>
</tr>
<tr>
<td>Full Professor</td>
</tr>
<tr>
<td>Assoc. Professor</td>
</tr>
<tr>
<td>Assist. Professor</td>
</tr>
<tr>
<td>New Asst. Prof.</td>
</tr>
<tr>
<td>Instructor</td>
</tr>
</tbody>
</table>
question on “how the new compensation system (competitive / market pay) could be implemented if there is little money to support it” (“UCM Faculty Compensation FAQ’s,” 2009, p. 3).

Response:
As implicit in the proposal, the salary pool would first be used to fund base salary. The president would also save a good portion of the salary pool to address equity issues as a result of implementing the model and market pay. Similar, to the implementation of the CJS system, the university would phase in the entire model over time as resources allowed (“UCM Faculty Compensation FAQ’s,” 2009, p. 3).

PURPOSE OF THE STUDY
The purpose of this study was two-fold: 1) to determine competitive (market) pay salary levels for faculty in Industrial Technology and Engineering Technology programs at Midwestern colleges and universities, and 2) to obtain concepts for funding faculty salary increases for individuals in these programs.

METHODOLOGY
A twenty-two question online survey was developed for a random group of (17) NAIT-affiliated Midwestern colleges and universities who possess Industrial Technology and Engineering Technology programs. Information was obtained from deans and chairs through an introductory email and enclosed web link to the survey. The survey was posted from mid-September through the end of October, 2008. See Appendix A for the content of the online survey. Individually-listed Midwestern college and university survey responses were kept confidential for this study. University of Central Missouri competitive pay institutional data was made available as a benchmark.

Descriptive survey data was used to categorize accrediting agencies used by programs, degree levels offered, student body size, competitive pay status, organizations used for competitive pay adjustments, faculty leaving due to lack of competitive pay, and faculty leaving within or outside of their respective state. A listing of competitive pay funding methods is provided.

A one-way analysis of variance (ANOVA) test was performed for each academic ranking in terms of institutions offering, or not offering, competitive pay. One institution indicated “I Don’t Know” and therefore their supplied ranking salaries were not used in ANOVA testing. An alpha level of .05 was used to determine if the use of competitive pay was statistically significant between institutions using it against those who did not.

Limitations exist in the study due to potentially limiting information provided by survey respondents. For instance, some faculty may leave educational institutions for other reasons besides salary. It is possible that survey respondents may not be aware of the true reason for a faculty member’s departure from their institution.

SURVEY RESULTS
Ten Midwestern colleges and universities responded to the survey out of a pool of seventeen (response rate: 58.8 percent). Six institutions use the Accrediting Board for Engineering and Technology – Technology Accrediting Commission (ABET-TAC); seven use the National Association of Industrial Technology (NAIT). Therefore, nine out of ten education institutions use ABET-TAC or NAIT, while some use both to accredit their Industrial Technology and Engineering Technology programs.

Institutional degree levels offered by respondents included: one for professional certification; ten for undergraduate (Associate – 2 year); eight for undergraduate (Bachelor – 4 year); seven for graduate (Masters); and two for graduate (Doctoral).

Industrial Technology student body size by institution varied from 51 to 1001+ students. Three programs contained 376 – 500 students, and two programs contained 1001+ students. Engineering Technology student body size by institution varied from 0 to 375 students. Two programs contained 26 – 50 students, and two programs contained 101 – 150 students.

Six institutions provided competitive pay compensation benchmarking for their Industrial Technology and Engineering Technology programs. Three institutions did not adjust for benchmarking. One institution did not know if an adjustment for benchmarking was in place.

Eight institutions that used competitive pay benchmarking to professional organizations used the following: AAUP (2), ASEE (1), CUPA-HR (1), NAIT (2), and other (2).

Eleven faculty members have left survey responding institutions for industry due to salary in the last five years. Eight faculty members were lost to other engineering-related programs due to salary in the last five years. Of the employee losses reported, one was lost from one institution to another institution (within the same state); four were lost to other state institutions in another state.

Using the one-way ANOVA for institutions who use competitive pay against those who do not, the following results were obtained. Instructor rank was not statistically significant, $F(1, 7) = 0.71$, $p = .426$. Assistant Professor (without terminal degree) rank could not be calculated in Minitab due to minimal data (df of 1, error of 1). New Assistant Professor rank was not statistically significant, $F(1, 5) = 1.30$, $p = .306$. Assistant Professor rank (with terminal degree) was not statistically significant, $F(1, 7) = 4.65$, $p = .068$. Associate Professor rank was not statistically significant, $F(1, 7) = 3.31$, $p = .112$. Full Professor rank was statistically significant, $F(1, 7) = 17.34$, $p = .004$. Review Table 3 for a listing of mean salaries by rank.

Funding methods currently used, or in planning for use, to support competitive pay by the responding survey respondents consisted of the following for Industrial Technology and Engineering
Technology faculty members:
- Unionization of faculty helps to negotiate higher pay levels.
- Legislature and tuition increases.
- Pay is based upon educational and industrial standards.
- None, but NAIT demographics are used to increase faculty salary.
- Equity adjustments based upon data collected from CUPA-HR, ASEE, and NAIT.
- None, adjustments through SIUC Faculty Association IEA-NEA.

**CONCLUSIONS, IMPLICATIONS FOR HIGHER EDUCATION, AND FURTHER RESEARCH**

Based upon the study’s survey results, Midwestern United States higher education places a premium upon accreditation of their Industrial Technology and Engineering Technology programs through both/either NAIT and ABET-TAC. Many of these colleges and universities use AAUP, ASEE, CUPA-HR, or NAIT for competitive pay adjustments for faculty at their institutions. Faculty members may have left surveyed institutions for industry and other engineering-related institutions due to pay concerns.

It was interesting that only the full professor rank garnered a statistical significance of $p = .004$ when the one-way ANOVA test was conducted between institutions who use competitive pay against those who do not.

Competitive pay funding commentary from the ten institutions was minimal. Unionization of educators may not be feasible in Missouri since we are a “right to work” state. Tying competitive pay adjustments to academic benchmarking (AAUP, ASEE, CUPA-HR, NAIT, etc...) was the recommended method to obtain higher pay for Industrial Technology and Engineering Technology programs, but this is not beneficial if each college and university will not, or cannot, set aside the necessary funds. While not mentioned by survey respondents, industrially-successful donors may be one avenue. But if money cannot be raised through normal education-funded methods, legislation or tuition increases may be the only viable course to fund competitive pay for applied technology and engineering education-providing Midwestern college and university programs.

Further research of competitive pay should be conducted through a national survey of Industrial Technology and Engineering Technology faculty in NAIT and ABET-affiliated programs. Through this study, educators and industrial professionals may be provided with more comprehensive data of competitive pay levels of faculty. This national study could potentially indicate statistical significance of rank outside of full professors due to an increased sample size.

**REFERENCES**


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**Table 3. Survey Results – Mean Salaries by Rank**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Competitive Pay Institutions</th>
<th>Non-Competitive Pay Institutions</th>
<th>% Diff.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Professor</td>
<td>$82,413</td>
<td>$68,000</td>
<td>17.48%</td>
<td>$14,413</td>
</tr>
<tr>
<td>Assoc. Professor</td>
<td>$67,724</td>
<td>$61,000</td>
<td>9.92%</td>
<td>$6,724</td>
</tr>
<tr>
<td>Assist. Prof. (w/T.D.)</td>
<td>$60,057</td>
<td>$53,500</td>
<td>10.91%</td>
<td>$6,557</td>
</tr>
<tr>
<td>Assist. Prof. (w/o T.D.)</td>
<td>$50,000</td>
<td>$50,000</td>
<td>0%</td>
<td>$0</td>
</tr>
<tr>
<td>New Asst. Prof.</td>
<td>$57,125</td>
<td>$53,333</td>
<td>6.63%</td>
<td>$3,792</td>
</tr>
<tr>
<td>Instructor</td>
<td>$46,146</td>
<td>$41,667</td>
<td>9.66%</td>
<td>$4,459</td>
</tr>
</tbody>
</table>

N = 6 for competitive pay institutions; N=3 for non-competitive pay institutions

NAIT Name Change (December 17, 2008). National Association of Industrial Technology Name Change Proposal Letter from the NAIT Executive Board.


Appendix A

continued on next page
Appendix A - Survey

Page 1

Survey Background:

Participation in this research survey is voluntary and confidential. No question within this survey asks for your name or email address – although it does request the name of your academic institution. Responding to this online survey indicates consent to participate in the research study. Once the survey has begun, you may withdraw at any time by closing your browser up until the survey is submitted.

This survey is of minimal risk and does not require a letter of consent since no contact information is obtained, or computer-to-computer tracing information (about the survey participant) is provided to the principal investigator after the survey has been taken. The benefit of this survey for participants is only through the knowledge that research is being conducted on academic competitive pay for another academic institution. No monetary or social benefit is provided for participants in this study.

The Internet survey should take approximately 2 to 5 minutes and will be offered to each participant for an unlimited number of attempts (just in case you do not have the information the first time). No participant will receive future emails or communication about their past participation in the survey. Each participant should delete the email received from the School of Technology or support personnel.

The principal investigators for this research are Dr. John Sutton, Dr. Jeff Ulmer, and Dr. Scott Wilson, and they may be contacted at (660) 543-4439 or via e-mail at the University of Central Missouri, Warrensburg. Individuals interested in obtaining raw data from this survey may email the principal investigators.

Survey Purpose and Instructions:

The purpose of this confidential research survey is to determine competitive (market) pay salary levels for faculty in Industrial Technology and engineering technology programs at Midwestern colleges and universities. Obtain concepts for funding faculty salary increases for individuals in these programs.

NOTE: Participating individuals should have access to average wage information for lecturers, instructors, and professors (all ranks).

Information requested will also include data on how competitive (market pay) has been, or may be, funded at your university.

Final Assent:

If you agree to participate in this study, you may proceed to page 2 of the survey by clicking the “Continue” button below. If you do not agree with the information presented above, please close your browser to exit this survey.

Thank you for your time and effort!

Dr. John Sutton, Chair and Professor
School of Technology Chair
University of Central Missouri
1. The college or university where you work:

- Bemidji State University
- Bowling Green State University
- Colorado State University – Fort Collins
- Eastern Michigan University
- Ferris State University
- Indiana State University
- Morehead State University
- Murray State University
- Northern Illinois University – DeKalb
- Pittsburgh State University
- Purdue University
- Southeast Missouri State University
- Southern Illinois University – Carbondale
- University of Arkansas – Pine Bluff
- University of Nebraska – Kearney
- University of Northern Iowa
- University of Wisconsin - Stout
- Other

2. If your college or university was not listed in question 1, type in your workplace name:

- Textbox ________________

3. Industrial Technology and Engineering Technology accreditation(s) (check all that apply):

- Accrediting Board for Engineering & Technology (ABET-EAC; Engineering)
- Accrediting Board for Engineering & Technology (ABET-TAC; Engineering Technology)
- American Council for Construction Education (ACCE)
- American Society for Engineering Education (ASEE)
- National Association of Industrial Technology (NAIT)
- None
- Other

4. If your Industrial Technology and Engineering Technology program(s) are accredited through a different organization than those listed in question 3, type in your accreditation provider:

- Textbox ________________

5. Degree levels offered in your Industrial Technology or Engineering Technology program (check all that apply):

- Professional Certification
- Undergraduate (Associate - 2 year)
- Undergraduate (Bachelor - 4 year)
- Graduate (Masters)
- Graduate (Doctoral)
- Other
6. Industrial Technology student body size (total number of majors in all programs):
   - 0
   - 1 – 25
   - 26 – 50
   - 51 – 100
   - 101 – 150
   - 151 – 200
   - 201 – 250
   - 251 – 300
   - 301 – 375
   - 376 – 500
   - 501 – 650
   - 651 – 800
   - 801 – 1000
   - 1001+

7. Engineering Technology student body size (total number of majors in all programs):
   - 0
   - 1 – 25
   - 26 – 50
   - 51 – 100
   - 101 – 150
   - 151 – 200
   - 201 – 250
   - 251 – 300
   - 301 – 375
   - 376 – 500
   - 501 – 650
   - 651 – 800
   - 801 – 1000
   - 1001+

8. Does your institution provide competitive (market) pay for industrial technology and engineering technology faculty?
   - Yes
   - No
   - I don’t know

9. If applicable, check the organization used for yearly competitive (market) pay benchmarking:
   - AAUP
   - ABET
   - ACCE
   - ASEE
   - CUPA-HR
   - NAIT
   - Other
   - Our institution does not benchmark pay for faculty

10. If your institution has a different benchmarking organization than those listed in question 9, type in your organization’s name:
    - Textbox ________________
11. Enter the average salary paid to Lecturers (Adjunct, part-time, leave out the comma):
   • Textbox ______________

12. Enter the average salary paid to Instructors (9 to 10 month contract, leave out the comma):
   • Textbox ______________

13. Enter the average salary paid to Assistant Professors without a terminal degree (9 to 10 month contract, leave out the comma):
   • Textbox ______________

14. Enter the average salary paid to NEW Assistant Professors (less than two years) (9 to 10 month contract, leave out the comma):
   • Textbox ______________

15. Enter the average salary paid to all Assistant Professors (9 to 10 month contract, leave out the comma):
   • Textbox ______________

16. Enter the average salary paid to Associate Professors (9 to 10 month contract, leave out the comma):
   • Textbox ______________

17. Enter the average salary paid to Full Professors (9 to 10 month contract, leave out the comma):
   • Textbox ______________

18. List the number of faculty who have left your institution for industry due to salary in the last five years.
   • Textbox ______________

19. List the number of faculty you have lost to other engineering-related programs due to salary in the last five years.
   • Textbox ______________

20. Of the faculty you lost to other engineering-related programs, did they stay within your state or go to another state?
   • Textbox ______________

21. State how your institution has funded, or plans to fund, competitive (market) pay for industrial technology and engineering technology faculty members. Supply a web link to your policy and wage structure if available.
   • Textbox ______________

22. General comments related to this survey:
   • Textbox ______________