Engaging with Academia and Institutions of Higher Learning

Jake Smithwick, PhD, FMP, SFP
The Simplar Institute
University of North Carolina at Charlotte
Group of *researchers* and *educators*

Integrated within the *parties* (clients/buyers and vendors)

Developed *tools, methods, & training* to enhance:

- Organizational Transformation
- Procurement & Sourcing
- Project & Risk Management
- Operational Efficiency
- Human Dimensions
- Performance Measurements
- Benchmarking & Workforce
- Facility Management Professional Training
How Academia Can Help You

• Learn & discover new things...
  – hiring service providers
  – personal / team skills development
  – data collection... on almost anything
  – development & deployment of a national training program
  – new tools for predictive maintenance
  – new applications of BIM
  – scope of work development & analysis
  – and the list goes on and on...

• Capture an engaged audience [i.e., students]
  – think workforce solutions
Knowledge Discovery

Research
- funding ($)
- data collection

Dissemination
- publications
- technical reports

Teaching
- quality instruction
- workforce
- problem solving
FM: Use-inspired Research

Industry

Facility Management

Research

Education
Academic Partnerships

- Promote consistent and thorough FM education by sharing program best practices for curriculum, course design, and textbooks

- Improve the quality of FM research

- Support early-career academic professionals
Peer-reviewed FM Research

• “Peer review” = others have assessed the validity of the work
  – based on data vs. marketing
  – historical context / other work in the area

• Open access – free to everyone

www.jfmer.org
Regular Articles

35  Competitive Benchmarking with FM Customer and Occupant Satisfaction Surveys
    Justin Dodd, Jake Smithwick and Mike Bown
    Abstract | Full Text | PDF (515 KB) | Track Citations (RSS | Email)

45  Investigation of Stadium Performance: Case of NCAA Division I Football Stadiums as Non-Sporting Event Venues
    Andrew Hammond, Seungbun Lee, Matthew Juravich and Alan Kornspan
    Abstract | Full Text | PDF (97 KB) | Track Citations (RSS | Email)

53  Employment Barriers into US Healthcare Management Industry for New Facilities Management College Graduates
    Steven Call, Kenneth Sullivan and Jake Smithwick
    Abstract | Full Text | PDF (560 KB) | Track Citations (RSS | Email)

62  Assessing users’ perception of Facilities Management services in a Public University: A case study approach
    Sunday Olarinre Oladokun and Cyril Ayodele Ajayi
    Abstract | Full Text | PDF (108 KB) | Track Citations (RSS | Email)

74  Process Model for the Food Service in Swiss Hospitals
    Oliver Weisshaupt, Gabriela V. Leiblein-Züger and Susanne Hofer
    Abstract | Full Text | PDF (2737 KB) | Track Citations (RSS | Email)

83  Code Compliance and Functionality of Low-Energy Automatic Doors at Universities
    Michael Bown and Mark D. Hutchings
    Abstract | Full Text | PDF (122 KB) | Track Citations (RSS | Email)
Other articles

- A Strategic Approach to Target Capital Investment on Facility Assets: Literature Review
- Application of Lean Six Sigma to Improve Service in Healthcare Facilities Management: A Case Study
- Bribery: Am I a Criminal? Implications of the US Foreign Corrupt Practices Act and the UK Bribery Act in the Outsourced FM Environment
- Nauvoo Illinois Historic Site: A Facilities Management Perspective
- Point Cloud Applications for Disaster Remediation
- The Development of the Outsourced Facility Service Industry in Europe
- The Impact of the Physical Work Environment on Organizational Outcomes: A Structured Review of the Literature
- An Aging Workforce and Work Environment: A Hotel Case Study in China
- Book Review: Welcome to Your World
- Case Study of Load Shifting Using Thermal Energy Ice Storage in Public Facilities
- Impact of Solar Reflectance Attenuation and Roof Cleaning on a Cool Roof: Assessing Return on Investment for Facility Management
Roof Inspections with a Drone

- Feasibility of using drones vs. physical inspections
- Faculty partnered with the local FM on the process & collected data
- Published research results

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<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DJI Mavic Pro Drone Basic</td>
<td>$850</td>
<td>Standard DJI Model with stock gimbal and lens filter.</td>
</tr>
<tr>
<td>UAV Storage and operation peripherals</td>
<td>$450</td>
<td>Hard-case storage containers, i-pad mini (used), extra propellers, 4-battery charging manifold, carrying pack.</td>
</tr>
<tr>
<td>FAA 107 UAV Licencing Test</td>
<td>$150</td>
<td>Taken at participating airports</td>
</tr>
<tr>
<td>Study Time for UAV Licencing Test</td>
<td>Approx 12 hours</td>
<td>FAA document and youtube training videos used as study guides. 70% accuracy for passing grade.</td>
</tr>
<tr>
<td>Inexpensive Practice Drone</td>
<td>$20-60</td>
<td>Drone with extra batteries and propeller protectors. Price range is between $20-60 for economic non-GPS models.</td>
</tr>
<tr>
<td>Flying Practice Time</td>
<td>20-40 Hrs</td>
<td>Recommended to practice at sporting events, weddings, hikes etc. Outdoors, not indoors.</td>
</tr>
<tr>
<td>Software Learning and Practice</td>
<td>20 hrs</td>
<td>DJI unit software, DroneDeploy, Pix4d, Litchi etc. Recommend using free software first, then free trial software period before deciding on a software to purchase. Must learn specifics in Flight Planning programing.</td>
</tr>
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</table>

Total Cost & Time: $1,510 72.5 Hrs

https://www.jfmer.org/doi/full/10.22361/jfmer/93832
Load Shifting w/ Thermal Energy Ice Storage

• Method of producing energy in one time period for the use during a different time period.

• Ice storage produced during energy “off-peak” hours used to shift energy “on-peak” demand load.

• RESULTS: annual savings of $40K; ROI of 3.31 years

National FM Team Training Program

• Encourage professional development and training of current employees
• Encourage FMs to share with one another and develop new ideas
  – Share internal tools/practices to compare/contrast against other organizations’ tools/practices
  – Determine if there are established leader
  – Develop examples that new hires can use to learn best practices
Metrics need to have a purpose... positive accountability
  – How do we improve?
  – What does the supplier recommend?

• Read the article: http://bit.ly/omaudit

June 5 webinar!
**I. Summary**

There are currently several office spaces at our Faulkner site that are in need of improvements. These spaces house current tenants that will be moving to new spaces which will allow us to add these spaces with minimal intrusion and allow a blank slate.

The spaces affected are for headcount additions as well as current employees moving within their department relocations or expansions (Quality Assurance, Human Resources). These spaces date back to 1984 with minimal renovation of any kind. Additionally, with our new Vice President of Operations moving in to his space there are pertinent renovations that should occur in this office that is dated back to 1995 in appeal when it was originally added on.

We are in need of repainting our Faulkner site front entrance. This area was built in 1984 with little renovation work being completed other than general landscaping over the years. The costs for completion include a slip resistant concrete entrance with brick borders, new company signage, imap, and 3-new flagpoles.

Estimated costs for all of the above: $120,107

**II. Needs/Problems**

There are currently several office spaces that are in need of renovations ranging from office layout changes, 508 compliance, & some furniture. The purchase of our building by Drexel University and the subsequent move of all employees being relocated to two offices as well as the Faulkner Executive for 2014, now will be the optimal time to complete these much-needed renovations as employees are moving out of the space.

In addition, the Faulkner site has a visitors' entrance/reception area that is derelict and not maintained. The area is a potential fire hazard as well.

- 1984 construction for the office
- Old furniture has been replaced in some areas but there is still a mix of old furniture
- Office lack of updated furnishings;
- Will need more office space and overall replacement.
- Visitor entrance does not have a better overall appearance than the direct box to main office. This will not be able to compete with the building's features to be an appealing front entrance.
FM Industry Demographics Study

• National Healthcare Facility Director Study
  – 217 unique directors and healthcare systems (US only)

• 57% Healthcare FM workforce will be retiring with 10 years
  – 35% in 5-10 years
  – 22% in less than 5 years

• Average experience prior to being a Healthcare FM
  – Build Tradesperson: 10yrs trade + 3yrs Management
  – Facility Professional: 5yrs trade + 7yrs Management
  – Construction Professional: 10yrs trade + 9yrs Management

• Average of 5 years to advance from entry level Healthcare FM
Figure 13. Deformation of the As-built Model (Left: 60mph; Middle: 65mph; Right: 70mph).
Disaster Remediation

**FIGURE 1.** Site photos of initial damage scan and after demolition scan areas.

**FIGURE 2.** Overlay of cloud data to assess structural damage and for redesign. (Provided by Crump Engineering Works, PLLC.)

https://www.jfmer.org/doi/full/10.22361/jfmer/75115

Dr. Glenda Mayo
Glenda.Mayo@uncc.edu
Process Modeling for Hospital Food Services

- Balance of sustainability, hygiene, and safety vs. cost


Professor Gabriela V. Leiblein-Züger, leiblein@zhaw.ch
Lean Six Sigma

• Read here: http://bit.ly/lsshealthcare

• Main idea
  – assess whether and how lean six sigma can be applied to healthcare FM services
Solar Reflectance Attenuation and Roof Cleaning on a Cool Roof

- Cost savings / payback period of cleaning a roof
- Full details: https://www.jfmer.org/doi/full/10.2361/jfmer/81613
Historic Site Facilities Management

- Unique challenges of managing volunteer workforce
- Recycling programs, local materials / means & methods

### TABLE 1.—Historic Preservation Campuses Comparison – See site references in bibliography

<table>
<thead>
<tr>
<th>Historical Site</th>
<th>Ongoing Restoration</th>
<th>Ongoing Reconstruction</th>
<th>Full-time Workforce</th>
<th>Volunteer Workforce</th>
<th>Livestock Program</th>
<th>Regularly Scheduled Entertainment</th>
<th>Tour guides</th>
<th>Funding Source</th>
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<tbody>
<tr>
<td>Nauvoo Historic Site, IL</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Historic Kirtland, OH</td>
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<td>No</td>
<td>Yes</td>
<td>Donations</td>
</tr>
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<td>Historic Palmyra, NY</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Donations</td>
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<tr>
<td>Abraham Lincoln’s New Salem, IL</td>
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<td>Colonial Williamsburg, VA</td>
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<td>Yes</td>
<td>Yes</td>
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<td>LDS Priesthood Restoration Site, PA</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Donations</td>
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<td>This is the Place Heritage Park, UT</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Fee</td>
</tr>
</tbody>
</table>
How are project teams selected?

- Qualifications
- Availability
- Past experience with the client
- Geographic location
- Other factors

What makes someone a good fit?
How might these be used?

- **Hire the Right Talent**
  - Increased probability of finding employees who are the right “fit”

- **Identify Existing Talent**
  - Assess likelihood of success

- **Retain Talent**
  - Grow employees to achieve their maximum potential
Over 30 Master Degrees and 4 PhD Dissertations

- What Psychological Tools are Available
- How to Assess People and Teams
- How to Collect Data
- What Data to Collect

Top 4 Tools Identified

- HEXACO
- Myers Briggs
- Emotional Intelligence
- DISC
## Enhanced Decision Making

### HiPerf PM
- **Honesty**: 3.78
- **Emotionality**: 2.84
- **Extraversion**: 3.45
- **Agreeableness**: 2.89
- **Conscientiousness**: 3.89
- **Openness**: 3.02
- **EQ**: 72
- **MBTI**: ISTJ
- **DISC**: D

### “Susan”
- **Honesty**: 3.21
- **Emotionality**: 2.99
- **Extraversion**: 3.33
- **Agreeableness**: 2.75
- **Conscientiousness**: 3.71
- **Openness**: 2.9
- **EQ**: 71
- **MBTI**: ESTJ
- **DISC**: D

### “Larry”
- **Honesty**: 3
- **Emotionality**: 2.65
- **Extraversion**: 3.9
- **Agreeableness**: 3.56
- **Conscientiousness**: 4.12
- **Openness**: 2.12
- **EQ**: 68
- **MBTI**: ISTJ
- **DISC**: D

### “Bob”
- **Honesty**: 4.51
- **Emotionality**: 3.12
- **Extraversion**: 3.45
- **Agreeableness**: 3.32
- **Conscientiousness**: 2.99
- **Openness**: 2.56
- **EQ**: 78
- **MBTI**: ISFJ
- **DISC**: D

### Aptitude Match
- **HiPerf PM**: 94%
- **Susan**: 85%
- **Bob**: 78%
Professional Training
Key Finding: Organizational Impact

• 70% of organizations rate IFMA credentialed employees as having significantly higher performance

• For every $2,000 that a company spends on an employee to get trained/credentialed, they experience a 12% increase in employee performance on average
  – The average cost of 1% enhancement in employee performance is $164

• The average training for an IFMA credential results in more than a 40% increase in employee performance

The Unmet Need

- 94% of organizations agree that FM training is needed
- 30% of organizations have internal FM training
Professional Training in the Built Environment

• Pedagogy vs Andragogy

• Large gaps in andragogy
  – Less than 6 research tests published (where adults were measured)

• Many needs identified, competencies, disciplines, etc.

• No models to design and execute

• Area of recent research and testing of Simplar
An Approach to Adult Training

Learner & Content Considerations

Questions to Consider for Adult Learners
- What is the average participant’s need for this topic?
- Has the need for the instruction been empirically established?
- What have been the learners’ previous experiences?
- How relevant is the topic of the instruction to the learners?
- How important is the topic/skill to the learners?
- What is the benefit to the individual learner and the organization?

Construction Industry Considerations
- To better understand the participants’ background, experiences, and preferences, you can conduct interviews and surveys.
- The instructor should be able to anticipate learners’ needs and goals, and adjust the content accordingly.
- The course should be designed to meet the needs of the construction industry.

Application to This Research Test
- The seminar was offered to members of a professional organization.
- The seminar was designed to meet the needs of the participants.
- The seminar was designed to meet the needs of the learners.
- The seminar was designed to meet the needs of the construction industry.

Design

Questions to Consider for Adult Learners
- What skills/knowledge are intended to be taught?
- How complex will these skills be to the average participant?
- How may these skills be to the average participant?
- How does the topic relate to learners’ daily tasks?
- Common situations?
- How will the instructor ensure that the course is relevant to the learners?
- How will the instructor encourage learners to participate in the course?
- How will the learners be able to apply what they have learned in the course?

Construction Industry Considerations
- Frame the course to be learned in a way that connects the learning to the industry.
- Participants can relate to the course.
- Consider the learner’s learning style and adjust the course accordingly.

Application to this Research Test
- The seminar was designed to meet the needs of the participants.
- The seminar was designed to meet the needs of the learners.
- The seminar was designed to meet the needs of the construction industry.

Execution

Questions to Consider for Adult Learners
- How will the instructor refer to the learners and avoid using the terms “you” or “they”?
- Is the environment welcoming and not dominated by the appearance of the instructor?
- Is the environment welcoming and not dominated by the appearance of the teacher?
- Will the instructor ensure that the course is relevant to the learners?
- How will the instructional strategies be selected for the course?

Construction Industry Considerations
- In lieu of the term “student,” the instructor can use the term “construction management student” for clarity.
- The course should be designed to meet the needs of the construction management students.
- The course should be designed to meet the needs of the learners.

Application to this Research Test
- The seminar was designed to meet the needs of the participants.
- The seminar was designed to meet the needs of the learners.
- The seminar was designed to meet the needs of the construction industry.

Evaluation

Questions to Consider for Adult Learners
- How will it be determined/measured that the participants have obtained the skills/knowledge intended to be taught?
- How will it be determined/measured that the participants have obtained the skills/knowledge intended to be taught?
- How will learners’ satisfaction with the training be measured?
- How will it be determined/measured that the participants are using the skills/knowledge in their jobs?
- How will any benefits that the company experiences from the learning be measured?

Construction Industry Considerations
- Incorporate feedback from multiple project stakeholders for a balanced perspective.
- Consider measuring the applications of the skills/knowledge on an expected project versus at work, generally.
- As projects are executed in a dynamic team environment, consider the impact of the project team on the learner’s ability to apply their learning.
- Use the company’s performance appraisal as a potential means to identify company benefits.

Application to this Research Test
- Application of the skills was measured via the team submissions from the workshop.
- A learner satisfaction questionnaire was used as part of the pilot testing process for the workshop.
- A facilitator/observer role was created, which required two to three people to observe each team and assess the team’s effectiveness and overall performance as a team.
Iron Curtain of Knowledge

• Greatest barrier to learning something new is what we think we already know
## Research Studies

<table>
<thead>
<tr>
<th>Title</th>
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<tbody>
<tr>
<td>Creating Support for Organizational Change</td>
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<tr>
<td>Practices that Drive Organizational Change Adoption</td>
</tr>
<tr>
<td>Resistive Behavior Types in Organizational Change</td>
</tr>
<tr>
<td>Overcoming Resistance to Change</td>
</tr>
</tbody>
</table>

June 19 webinar!
Recommendations

• Invite faculty to your local IFMA chapter meetings to present on their research
  – FM, construction management
  – But also business, finance, communications, sustainability

• Need innovative ways to solve problems? Consider partnering with academia.

• Actively pursue internships with local college / university

• Thinking about retirement? Many institutions have teaching opportunities.
Questions

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