Engaging with Academia and Institutions of Higher Learning

Jake Smithwick, PhD, FMP, SFP
The Simplar Institute
University of North Carolina at Charlotte
Simplar Institute

• 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
Findings

• 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, Seungbum 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 Olanirun 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 Outsources 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
Examples
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

https://www.jfmer.org/doi/full/10.22361/jfmer/93832

<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>
<tr>
<td>Total Cost &amp; Time</td>
<td>$1,510 72.5 Hrs</td>
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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 FM's 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
Janitorial Auditing

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!

JaFMER
Journal of Facility Management Education and Research
Building Assessments

Building Assessment Report

Business Administration Building
Arizona State University
Building Number 40
300 E. Lemon Street
Tempe, Arizona 85287

Date: 5/16/17

I. Summary

There are currently several office spaces at our Faulkner Rd facility that are in need of renovations. These spaces have 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 with their department relocations or expansions (Quality Assurance & Human Resource). These spaces date back to 1994 with minimal renovation of any kind. Additionally, our new Vice President of Operations moving into his space there are pertinent renovations that should occur in this office that is dated back to 1995 in appeal when it was originally opened.

We are also in need of repeating our Faulkner Rd front entrance. This area was built in 1993 with little renovation work being completed other than general landscape over the years. The costs for completion include a wider concrete entrance with planter beds, new company signage, beacon, and 3 new flagpoles.

Estimated costs for all of the above: $200,183

Timeline: February 2014 through May 2014, in order to divertly this capital costs as well as to avoid ground breaking other than front entrance.

II. Needs/Problems

There are currently several office spaces that are in need of renovations ranging from current employees moving the 3rd floor offices and current offices, with the purchase of our building by Dept. A and the subsequent office employees being relocated to new offices as well as the Faulkner Rd back for 2014, this would be the optimal time to complete these much needed renovations as employees are moving into new offices.

In addition, there are windows that are off center and blocking views.

We also have a better approach to our board room that could be done in a smaller renovation to our board room.

III. Goals/Objectives

- New office furniture for Faulkner Rd.
- New office furniture for Faulkner Rd.
- New office furniture for Faulkner Rd.

IV. Procedures/Scope of Work

In order to keep costs down for this project we will utilize all of our office furniture for the scope of this project, this includes:

- Mid-team office furniture
- Bartel Construction, office furniture
- O&H Office Furniture, office furniture
- New office furniture for Faulkner Rd.
• 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: 10 yrs trade + 3 yrs Management
  – Facility Professional: 5 yrs trade + 7 yrs Management
  – Construction Professional: 10 yrs trade + 9 yrs Management

• Average of 5 years to advance from entry level Healthcare FM
Structural Wall Integrity Investigation

Dr. Don Chen
dchen9@uncc.edu

**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.

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

Dr. Glenda Mayo
Glenda.Mayo@uncc.edu

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


• 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

<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>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Donations</td>
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<tr>
<td>Historic Kirtland, OH</td>
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<td>Yes</td>
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<td>No</td>
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<tr>
<td>Historic Palmyra, NY</td>
<td>Yes</td>
<td>No</td>
<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>
<td>No</td>
<td>No</td>
<td>Yes</td>
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<td>No</td>
<td>Yes</td>
<td>Fee</td>
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<tr>
<td>Colonial Williamsburg, VA</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Fee</td>
</tr>
<tr>
<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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<tr>
<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
Road to Today

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

<table>
<thead>
<tr>
<th>HiPerf PM</th>
<th>“Susan”</th>
<th>“Larry”</th>
<th>“Bob”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honesty</td>
<td>3.78</td>
<td>3.21</td>
<td>3.0</td>
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<tr>
<td>Emotionality</td>
<td>2.84</td>
<td>2.99</td>
<td>2.65</td>
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<tr>
<td>Extraversion</td>
<td>3.45</td>
<td>3.33</td>
<td>3.9</td>
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<tr>
<td>Agreeableness</td>
<td>2.89</td>
<td>2.75</td>
<td>3.56</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>3.89</td>
<td>3.71</td>
<td>4.12</td>
</tr>
<tr>
<td>Openness</td>
<td>3.02</td>
<td>2.9</td>
<td>2.12</td>
</tr>
<tr>
<td>EQ</td>
<td>72</td>
<td>71</td>
<td>68</td>
</tr>
<tr>
<td>MBTI</td>
<td>ISTJ</td>
<td>ESTJ</td>
<td>ISTJ</td>
</tr>
<tr>
<td>DISC</td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

**EQ**
- HiPerf PM: 71
- “Susan”: 71
- “Larry”: 68
- “Bob”: 78

**MBTI**
- HiPerf PM: ISTJ
- “Susan”: ESTJ
- “Larry”: ISTJ
- “Bob”: ISFJ

**Aptitude Match**
- HiPerf PM: 94%
- “Susan”: 85%
- “Larry”: 78%
Professional Training
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 content?
- Has the need for the instruction been empirically based?
- Do the learners have the necessary background to understand the content?
- What are the barriers to learning and how can they be overcome?
- How relevant is the topic to the learners?
- How can the content be delivered to the learners?
- What is the benefit to the individual learner and society?

Construction Industry Considerations
- To better understand the participants’ backgrounds and experiences, it is suggested that the content is delivered in a workshop that includes a mix of industry professionals, students, and those interested in the field.
- The instructor should be familiar with the construction industry and its challenges.
- The content should be delivered in a way that allows for questions and discussions.
- The workshop should include activities that allow participants to apply the content in a practical setting.

Application to this Research Test
- The seminar was delivered to a group of professionals in the construction industry to assess the effectiveness of the training.
- The participants were asked to complete a survey to evaluate their understanding of the content and their ability to apply it.
- The survey results showed a high level of satisfaction with the training.

Questions to Consider for Adult Learners
- What are the learner’s prior experiences with similar topics?
- How can the learner’s background be leveraged to enhance learning?
- How can the learner’s prior experiences be used to facilitate learning?

Design

Questions to Consider for Adult Learners
- What skills/knowledge are intended to be taught?
- How complex will these skills be for the average learner?
- What real-world situations will learners face?
- How will the learner be motivated to learn?
- How will the learner be able to self-assess their learning?
- How will the learner be able to apply what they have learned to their work environment?

Construction Industry Considerations
- Frame content to be learned in reference to common challenges and solutions. Consider the practical aspects of construction projects and how they impact the workforce.
- Address the needs of team members, including contractors, engineers, and architects.
- Provide opportunities for peer review and feedback.

Application to this Research Test
- The workshop was designed to address common challenges faced by the construction industry.
- Participants were encouraged to share their experiences and provide feedback on the workshop.
- The workshop was followed by a quiz to assess the learners’ understanding of the content.

Questions to Consider for Adult Learners
- How will the learner be able to apply what they have learned to their work environment?
- How will the learner be able to self-assess their learning?
- How will the learner be able to self-monitor their progress?

Execution

Questions to Consider for Adult Learners
- How will the instructor refer to the learners and avoid using the term “student”?
- How will the instructor facilitate group discussions?
- How will the instructor ensure that learners are engaged and participating?
- How will the instructor support learners who are struggling?

Construction Industry Considerations
- In lieu of the term “student,” the instructor can use the term “construction stakeholder” or “participant” to refer to learners. This approach helps to focus the discussion on the participants’ experiences and knowledge.
- The instructor should facilitate group discussions by asking open-ended questions and encouraging learners to share their experiences.
- The instructor should support learners who are struggling by providing additional resources and guidance.

Application to this Research Test
- The workshop was designed to facilitate group discussions and encourage learners to share their experiences.
- The instructor facilitated group discussions by asking open-ended questions and encouraging learners to share their experiences.
- The instructor provided additional resources and guidance to learners who were struggling.

Questions to Consider for Adult Learners
- How will the learner be able to self-assess their learning?
- How will the learner be able to self-monitor their progress?
- How will the learner be able to self-regulate their learning?

Evaluation

Questions to Consider for Adult Learners
- How will the learner be able to self-assess their learning?
- How will the learner be able to self-monitor their progress?
- How will the learner be able to self-regulate their learning?

Construction Industry Considerations
- Incorporate feedback from multiple industry stakeholders for a balanced perspective.
- Consider measuring the applications of the skills/knowledge on a construction 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 appraisal process to evaluate the learner’s performance.

Application to this Research Test
- Application of the skills was measured via the team submissions from the workshop.
- A learner satisfaction questionnaire was used to assess the overall training experience.
- A facilitator/observer role was created, which required two to three observers to evaluate the team’s overall performance and the team’s effectiveness.

Questions to Consider for Adult Learners
- How will the learner be able to self-assess their learning?
- How will the learner be able to self-monitor their progress?
- How will the learner be able to self-regulate their learning?
Greatest barrier to learning something new is what we think we already know
### Research Studies

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