



The Design of the Finnish Sauna Five Mysteries for Future Research

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Workshop outline

1. Introduction (2 min)
2. Main components in a Finnish sauna (3 min)
3. The greatest remaining mysteries (5 min)
4. Small group exercise to discover ways to solve the mysteries (10 min)
5. Discussion (5 min)



Workshop goal

Document ideas on how to
solve the mysteries and refine
their questions



INTRODUCTION



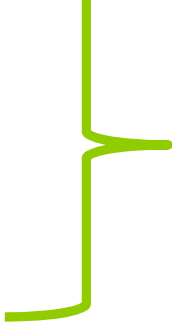
MAIN COMPONENTS IN A FINNISH SAUNA



GREATEST REMAINING MYSTERIES



5 Mysteries

1. Model for measuring sauna user experience
 2. Factors and effects in sauna air quality
 3. Sauna stone behavior under heat stress
 4. Improving efficiency and decreasing emissions in wood-fired saunas
 5. Modeling of sauna physics for engineering purposes
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- A green bracket on the right side of the list, grouping the first three items.



Model for measuring sauna user experience

- In the design world, for over 15 years researchers have been concerned about measurement of user/customer experience
 - “IF YOU CAN NOT MEASURE IT, YOU CAN NOT IMPROVE IT.” –Kelvin
- If we believe in systematic differences? How to create objective measures to sauna experiences?
- Is it opinion, behavior or physiology



Factors and effects in sauna air quality

- There's a saying in Finnish that 'oxygen runs out' from a sauna.
 - That's plainly false
- How can we tell which factors are important and even which ones to look at?
 - How to compare their
 - Oxygen, carbon dioxide, ions



Sauna stone behavior under heat stress

- Around the world very different type of stones are used for sauna
- In Finland, stones are only “clinically” tested for asbestos
- Stones crumble under stress and it is claimed they can cause allergic reactions. Systematic information about stones properties is missing
- How to solve this question? How to estimate its importance (e.g. negative health effects)?



Improving efficiency and decreasing emissions in wood-fired saunas

- Finland has hundreds of thousands wood-fired sauna heaters. Their emissions are worse than with any other wood burning equipment and much energy is wasted
- With growing concern for adverse health effects, what **big scale** changes for sauna should be made?
- How to contextualize and weight this issue?



Modeling of sauna physics for engineering purposes

- Sauna rooms are relatively small, enclosed spaces heated with a single, simple heater
- Finns have design heuristic (e.g. Law of Löyly) that describe how sauna physics approximately work, but **there is too much guess work to the design sauna heating and natural ventilation**
- What benefits would a working computer model of sauna have? How accurate should it be? What would it cost to create it?



SOLVING THE RIDDLES



Questions to answer

- Which scientific discipline should work on this?
- Could there be analogous research in existence?
- How could related research be funded?
- If this was mystery was solved, how should the results be presented?



DISCUSSION & CONCLUSIONS



Present collected ideas

- By topic
- Are there other more important Finnish sauna design topics to be investigated?