The importance of quality plumbing training in Australia considering the implications on global health

Robert Funston & Richard Hutchinson
A life changing trip to the Netherlands
Sanitation
Access to water
Access to water
Delft
Delft
2 dumb plumbers
Concrete sand filters
Water filtration

PSF, RWH and Dug Well Raw water reservoir with sand filter

Tap
Outlet
Inlet
Heat-resistant tubing
Life straws
UV filtration
Polluted waterways
Multi stage filtration system

MULTI-STAGE FILTRATION SYSTEM

REFERENCES

Group 2
Module 11
Decentralized Water Supply and Sanitation
July, 2010
Multi stage filtration system
‘Closing the loop’: sustainable water supply and sanitation. The role of plumbing education in reaching this goal

Richard Hutchinson

Improving Plumbing Training in Australia considering the Implications on Global Health

Robert Funston

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“...the risks of inadequately trained people doing plumbing works are too great to ever compromise on training”
So, how do we teach plumbing for an industry that changes so fast?

- Population growth
- Climate change
- New technology
- Sustainability
- Pollution
- Water scarcity
- SE water Aquarevo estate
How plumbing was taught in the past

Hand out piles of textbooks for students to read

Processes which will soon be out of date
How to teach plumbing for the future

- Teach the Principles of Plumbing
- Employability skills
- Evidence based learning
- Industry participation/ partnerships
- Plumbing teachers to be true “dual professionals”
- LL&N
Teach the Principles - The Science of Plumbing
Principles of Plumbing—Heat transfer
Principles of Plumbing—Capillary action
Principles of Plumbing—Head Pressure
Principles of Plumbing - Siphonage
Principles of Plumbing – Expansion/contraction
As to methods there may be a million and then some, but principles are few. The person who grasps principles can successfully select his own methods. The person who tries methods, ignoring principles, is sure to have trouble.

Harrington Emerson 1912
How to teach plumbing for the future

• Teach the Principles of Plumbing
• **Employability skills**
• Evidence based learning
• Industry participation/ partnerships
• Plumbing teachers to be true “dual professionals”
• LL&N
# Employability Skills

## Top 10 Skills

<table>
<thead>
<tr>
<th>in 2020</th>
<th>in 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complex Problem Solving</td>
<td>1. Complex Problem Solving</td>
</tr>
<tr>
<td>2. Critical Thinking</td>
<td>2. Coordinating with Others</td>
</tr>
<tr>
<td>3. Creativity</td>
<td>3. People Management</td>
</tr>
<tr>
<td>4. People Management</td>
<td>4. Critical Thinking</td>
</tr>
<tr>
<td>5. Coordinating with Others</td>
<td>5. Negotiation</td>
</tr>
<tr>
<td>6. Emotional Intelligence</td>
<td>6. Quality Control</td>
</tr>
<tr>
<td>7. Judgment and Decision Making</td>
<td>7. Service Orientation</td>
</tr>
</tbody>
</table>

*Source: Future of Jobs Report, World Economic Forum*
How to teach plumbing for the future

• Teach the Principles of Plumbing
• Employability skills
• **Evidence based learning**
• Industry participation/ partnerships
• Plumbing teachers to be true “dual professionals”
• LL&N
Evidence based learning

Questioning

Show what success looks like

Multiple exposures

Metacognitive strategies
Evidence based learning

Collaborative learning

Setting goals

Feedback

Explicit instruction
How to teach plumbing for the future

- Teach the Principles of Plumbing
- Employability skills
- Evidence based learning
- Industry participation/ partnerships
- Plumbing teachers to be true “dual professionals”
- LL&N assistance
Industry partnerships

Reece plumbing supplies

Rheem hot water
Plumbing teaches as true “dual professionals”

Classroom strategies

Proper teacher training

Teacher Mentoring

Theory lessons “chunked” in small portions

Continual Professional development

Encouraging classroom dialogue, not monologue
Plumbing teachers as true “dual professionals”

I do

We do

You do
How to teach plumbing for the future

• Teach the Principles of Plumbing
• Employability skills
• Evidence based learning
• Industry participation/partnerships
• Plumbing teachers to be true “dual professionals”
• LL&N assistance
LL&N (language literature and numeracy)

Only covering maths where relevant.

Calculating Fall goes with drains
High fidelity activities.
### Old course student feedback...67% satisfaction

<table>
<thead>
<tr>
<th>Survey Items</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainers encouraged learners to ask questions</td>
<td>74.5</td>
</tr>
<tr>
<td>Trainers made the subject interesting as possible</td>
<td>66.8</td>
</tr>
<tr>
<td>Trainers had an excellent knowledge of the subject content</td>
<td>78.8</td>
</tr>
<tr>
<td>Trainers explained things clearly</td>
<td>69.4</td>
</tr>
<tr>
<td>Assessments had clear objectives and based on realistic activities</td>
<td>70.3</td>
</tr>
<tr>
<td>The course was well designed, delivered and organised</td>
<td>55.6</td>
</tr>
<tr>
<td>The learning resources were of a high quality</td>
<td>61.4</td>
</tr>
<tr>
<td>Appropriate support for my learning was available when I needed it</td>
<td>65.3</td>
</tr>
<tr>
<td>Facilities and equipment were sufficient, in good condition, and available when needed</td>
<td>57.9</td>
</tr>
<tr>
<td>The training will improve my capacity to get a job</td>
<td>74.5</td>
</tr>
<tr>
<td>Overall, I am satisfied with the training</td>
<td>64.0</td>
</tr>
<tr>
<td>I would recommend the training to others</td>
<td>66.7</td>
</tr>
<tr>
<td>I would recommend the training organisation to others</td>
<td>65.4</td>
</tr>
<tr>
<td>All Survey Items</td>
<td>67.0</td>
</tr>
<tr>
<td>Responses</td>
<td>107</td>
</tr>
</tbody>
</table>

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New course student feedback ...92% satisfaction
Questions?

Ask Questions!