

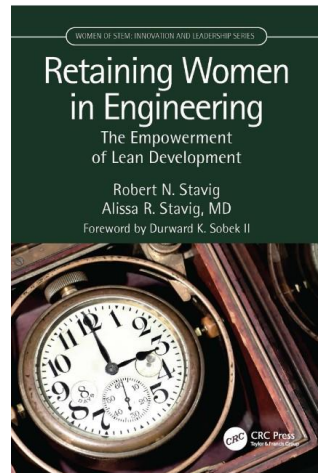
2023 LPPDE North American Conference
Creating a Culture of Innovation
Oct 2-5, 2023
Ann Arbor, MI

Half Day Workshop
Oct. 2, 2023

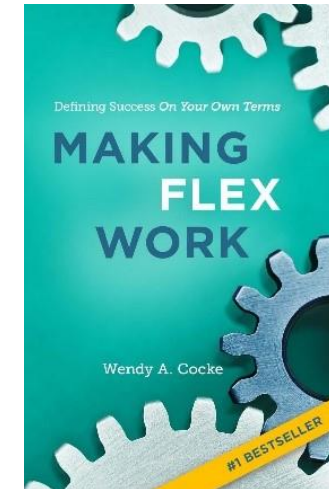
Retaining Women in Engineering – Leveling the Playing Field



Bob Stavig
Retired HP



PART 4



Wendy Cocke

ENGINEERING
LEADERSHIP
SOLUTIONS

We will focus on 5 areas:

- 1) The Gender Schema, (broader than stereotypes) Bias and Confidence.
- 2) The risks and benefits of women focusing on relational work (vs technical)
- 3) The current methods of traditional product development, how they create an unlevel playing field for women, and the learnings from medicine.
- 4) How to create a flexible (non traditional work schedule) using simple engineering principles using the Making Flex Work Workbook to
 - 1) “Get what’s right for you when it comes to work/life balance”
- 5) How to apply the six Principles of Lean Development to:
 - a. Significantly improve your organizations business performance.
 - b. Drive innovation, and
 - c. Level the playing field for women

This is the list we arrived at

- Growth Potential and Empowering Work Environment
- Gender Pay Gap (of minimal impact)
- Inspired to Come to Work
- The Type of Engineering and the Type of Work
- Relational Work
- (Desire for) Social Contribution and Communal Work
- The Choice for Other Work
- (Lack of) Career Path
- (Lack of) Women Role Models
- (Lack of) Work–Life Balance and Part-Time Work
- (Lack of opportunity) Innovation and Patents
- Work Climate (Issues)

We used a causal diagram to arrive at

Three Root Causes

- Lack of access to (reusable knowledge)
- The Way the work is done
- Lack of Role Models

Additionally we suggest 5 critical supporting issues

- Bias
- Lack of Technical Coaching
- Confidence
- Lack of focus on technical depth
- Need for Balanced work (relational and technical)

We add in the need for part-time work.

Change the way the work is done....

Now we make this leap to

*Lean Development
to:

Drive Better Business Results
And
Level the Playing Field

*Lean Product and Process Development is just
a longer name for the same intent.

Lean is the Elimination of
Waste

In development, waste is
anything that slows down
learning or decisions.

Research in the 80's and 90's
has shown that Lean
development is
4 times more efficient.

The Lack of Value ADD
Structure

and

Lack of Access to
Knowledge

Creates an unlevel playing field for women

Apply the Principles of **Lean Development**

1. The Creation of Reusable Knowledge

2. Cadence, Pull, and Flow

3. Visual Management

4. Entrepreneurial System Designer

5. Set-Based-Design (vs Build-Test-Fix)

6. Build Teams of Responsible Experts.

Allen C. Ward
2002

These come
from
research
concerning
Toyota's
success

The Creation of Reusable Knowledge

- The knowledge is being “written down” during the work of learning.
 - (It is not done after the fact)
- It is focused on clarity and conscience.
- It is findable by others.
- It has both scope and depth.
- It is technical and/or business (not fluff)

The A3 Problem Solving Process is a good tool/method to do this.

Set Based Design Vs Build-Test-Fix

- Identifying the Multiple options/ideas
- Establish the Knowledge Gaps for each.
- Fast learning to eliminate the weakest.
- Capture the learning as it is gained.
- Move the learning forward to stronger options
- End up with the strongest solution

Build Test Fix is like playing checkers
Set Based Design is like playing chess

Both of these promote Technical Excellence and Level the Playing Field

Build Test Fix vs Set Based Design

Retaining Women in Engineering: The Empowerment of Lean Development

Figures 9.1 and 11.1

© Robert N. Stavig and Alissa R. Stavig

Publishing Rights CRC Press

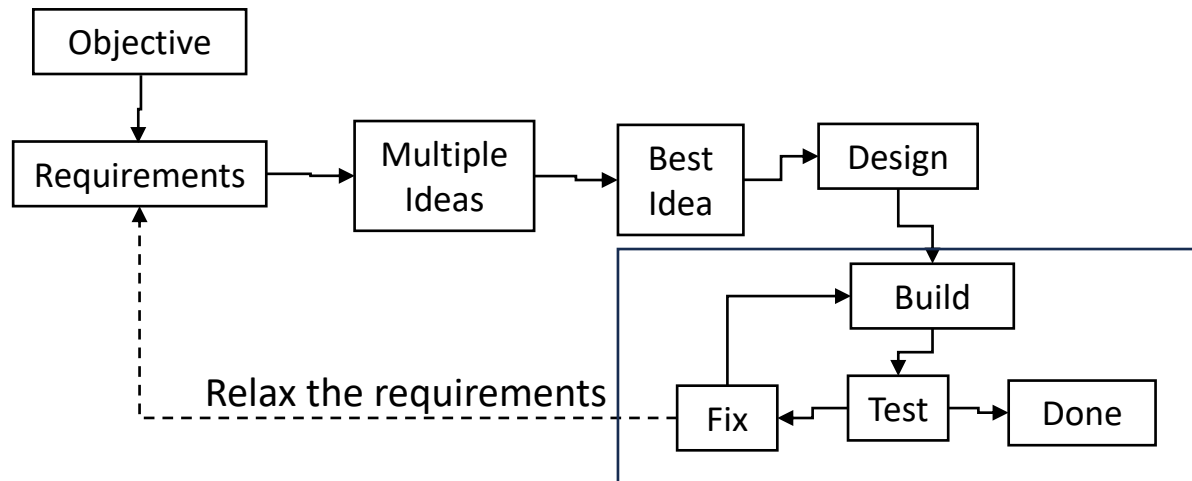
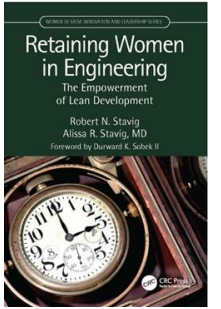


Figure 9.1 Traditional Development – Point Based Design - Build Test Fix.

Finding time in the schedule to learn....

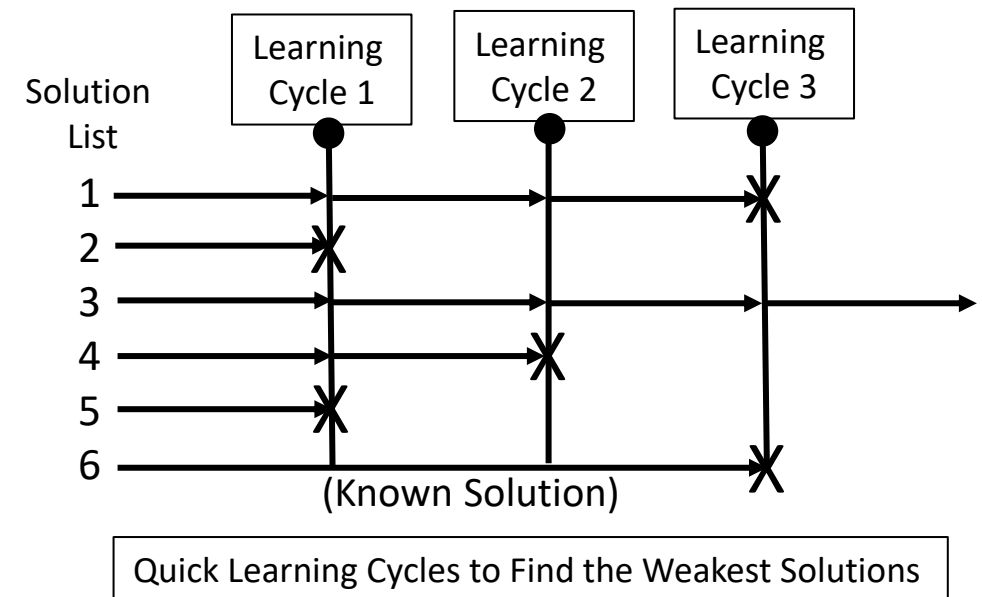


Figure 11.1, Set Based Design – Quick Learning Cycles.

Trade off Curve – Part of Set Based Design

Retaining Women in Engineering: The Empowerment of Lean Development

Figures 9.2

© Robert N. Stavig and Alissa R. Stavig

Publishing Rights CRC Press

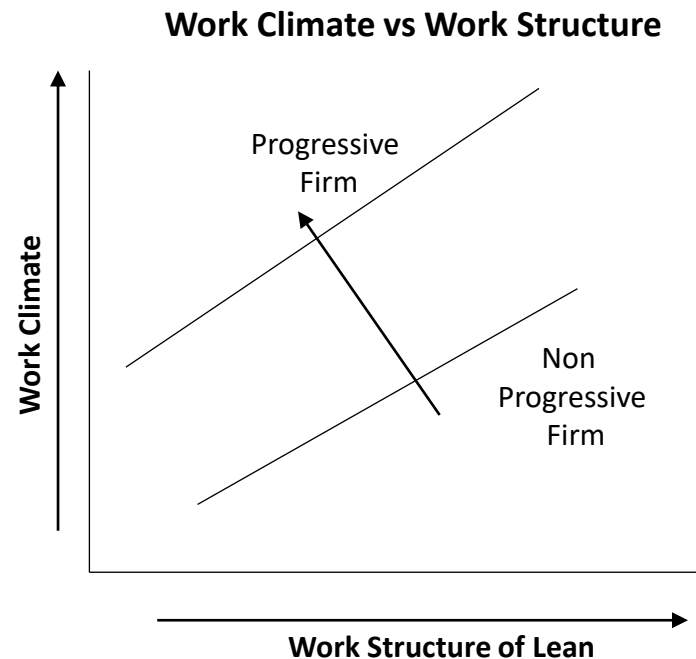
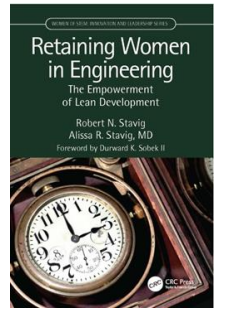


Figure 9.2 Work Structure Driving Climate.

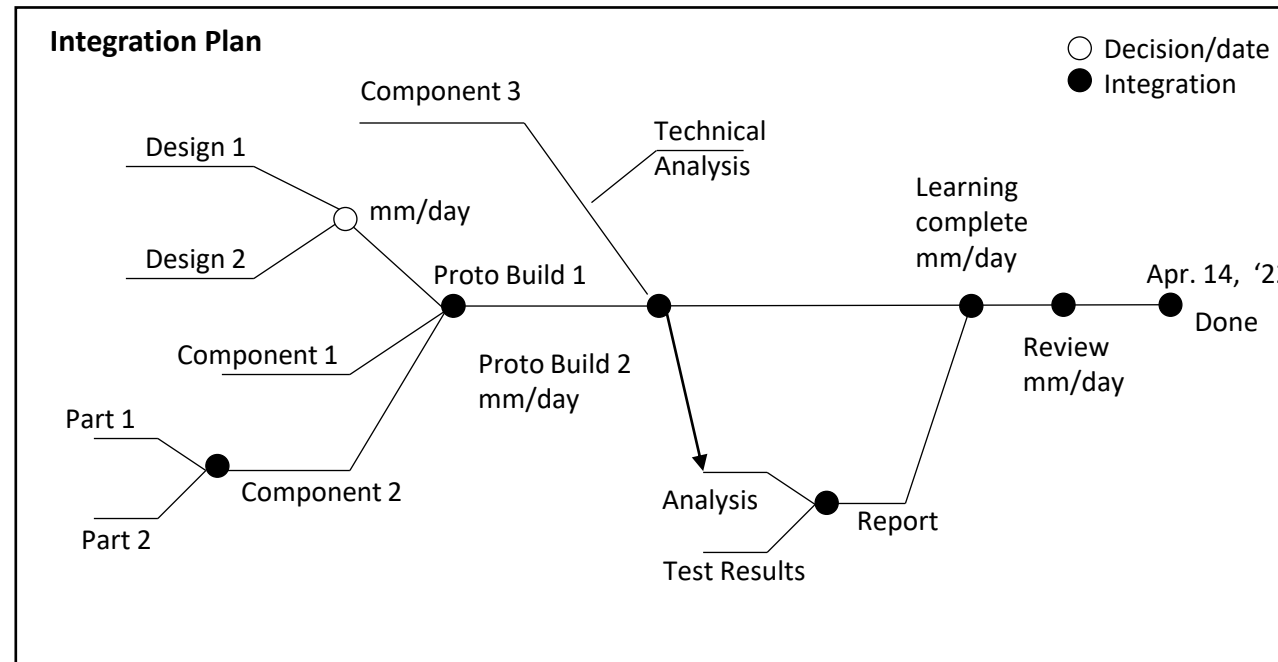
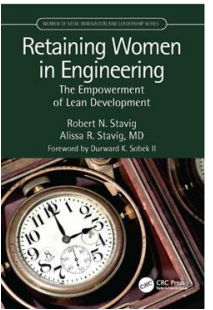
Flow Pull Cadence - Integration Plans

Retaining Women in Engineering: The Empowerment of Lean Development

Figures A.3

© Robert N. Stavig and Alissa R. Stavig

Publishing Rights CRC Press



Finding
Knowledge
Gaps

Figure A.3 Integration Plan, Contained Within an A3

It is NOT a Gantt Chart

Lets look at these from a fundamental set of engineering principles

Like heat transfer or fluid dynamics or sheet metal design

1. The Creation of Reusable Knowledge

2. Cadence, Pull, and Flow

3. Visual Management

4. Entrepreneurial System Designer

5. Set-Based-Design (vs Build-Test-Fix)

6. Build Teams of Responsible Experts.

Within your
organization what
letter grade would
you give each of
these?

So what do we do with this

We can look at how to influence an engineering organization

We can provide visibility of issues, premise, etc.. to female engineering students.

Enable them to start the change in their first job.