

# Designing for Flow in a complex activity

Jon Pearce  
Steve Howard  
Interaction Design Group  
Department of Information Systems  
University of Melbourne

## Overview

- What is flow?
- Flow models and measurements
- Experiment & analysis
- Issues of task vs artefact
- Implications
- Conclusion

## What is flow?

Enjoyable...engaging...focused...

Elements of flow:

Antecedents	Experiences	Consequences
clear goals	merging of action and awareness	autotelic
feedback	concentration	lack of self-consciousness
challenge matched by skills	sense of control	distortion of time

(Mihaly Csikszentmihalyi)

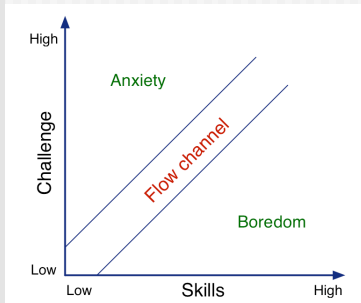
## What is flow?

*'The stream of ordinary experiences, ranging from the faintly pleasant to the boring, and the anxious, is made up of a random collection of discordant notes. Occasionally the notes fall into a harmonious chord – when that happens, information in the consciousness is ordered, and we experience flow.'*

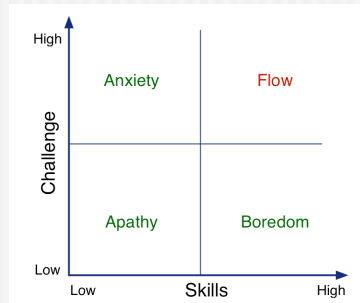
Massimini, F. and M. Carli (1988). The systematic assessment of flow in daily experience. *Optimal experience: psychological studies of flow in consciousness*. M. Csikszentmihalyi and I. S. Csikszentmihalyi.

# Models of flow

## 3-channel model

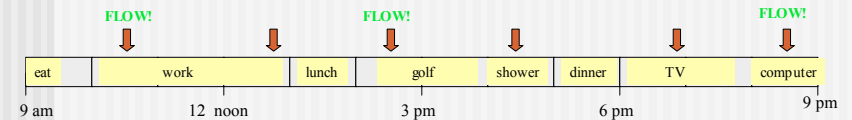


## 4-channel model



# Measuring flow

## Method 1: Experience Sampling Method (ESM)



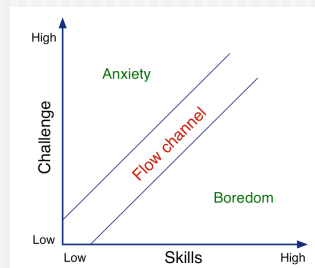
# Measuring flow

## Method 2: From the experience

e.g. flow = control + enjoyment + engagement

## Method 3:

Balance of  
*challenge and skills*



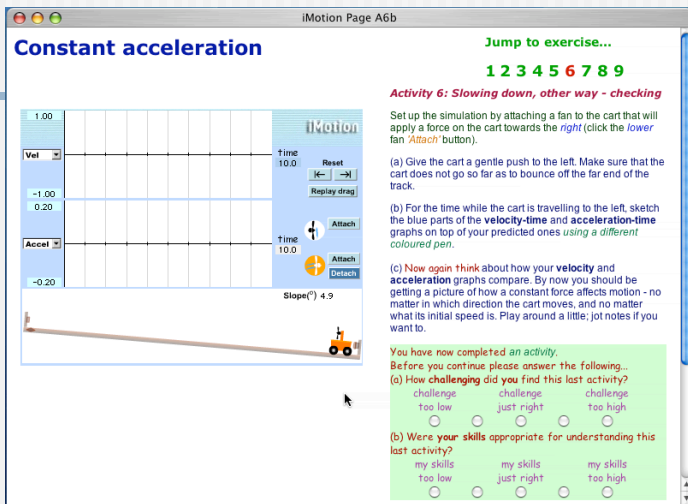
# Experiment

## 1. Aim

To identify flow in an interactive online learning context

## 2. Set up

- 59 students (lab of 25)
- Physics pre-test + *learning* + survey + post-test
- 8 students videoed in usability lab + interviews
- Data gathered by Web forms & Web logs



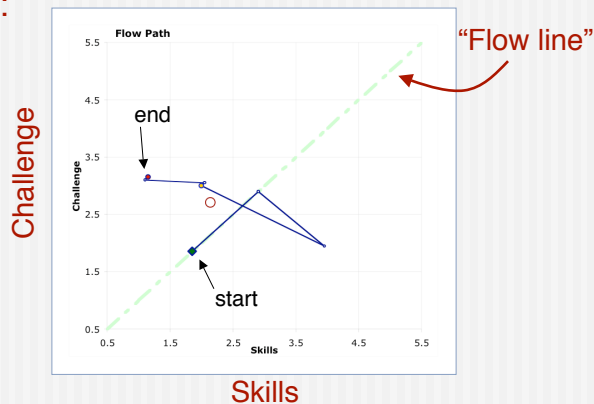
# Experiment

## 3. Measuring flow

- (i) During:
  - perceived challenges & skills
- (ii) After:
  - flow = control + enjoyment + (engagement)

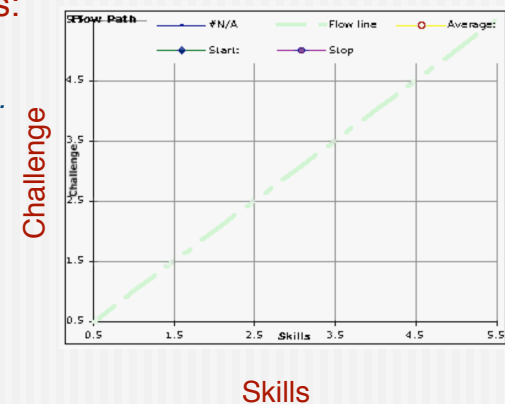
# Experiment

## 4. Analysis: 'flow path'



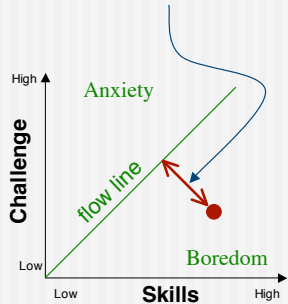
# Experiment

## 4. Analysis: 'flow path' of cohort...



# Process vs State: 3 comparisons

1. Visual?
2. 'From-flow' distance (*process*) & 'final-flow' (*state*)?  
 (i) *from-flow-distance* =  $0.25 \times (\text{skill} - \text{challenge})$

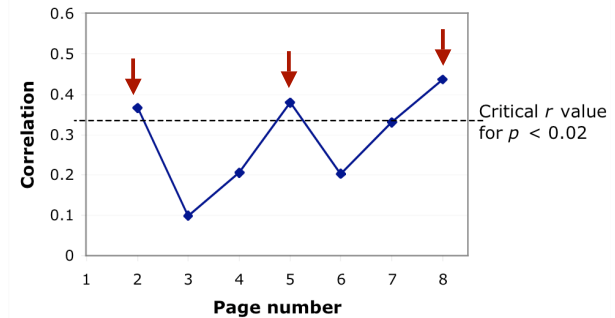


(ii) *final-flow* = (engagement) + enjoyment + control

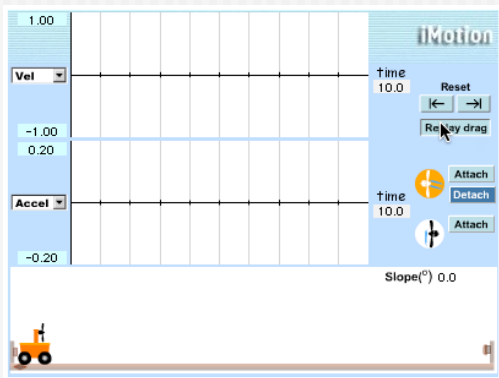
# Process vs State: 3 comparisons

3. Page-by-page comparison

From-flow-dist to final-flow correlations



# “Interesting event!”



# ‘Task’ vs ‘Artefact’

- Challenge-skills:  
 “the simulation wasn’t challenging but the concept that I got from the simulation was challenging.”
- Control
- Feedback

## Implications for design

---

Complexity is an issue

Challenge => engagement with artefact:

- directed at task
- artefact engaging, but not distracting
- transparency => task focus

'Artefact flow' => 'Task flow'

- Flow can help or hinder.

## Conclusions

---

Flow in learning - a *process*

Distinguish between *task* & *artefact*

Flow *can* support learning, but...

---

*Questions?*