



A study of 'flow' in an online learning environment

Jon Pearce

DIS Doctoral Consortium

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Overview

- What is flow?
- Aims and justification of research
- Description of experiments
- Ways of viewing flow
- Next step.



What is flow?

(Mihalyi Csikszentmihalyi)

■ Flow is:

- **deep concentration**
- **sense of control**
- **merging of action and awareness**

■ Conditions:

- **clear goals**
- **immediate & unambiguous feedback**
- **matching challenges and skills**

■ Effects:

- **loss of self-consciousness**
- **time distortion**
- **autotelic experience**



Aims

- Originally:
 - in what way do ***locus of control*** and ***flow*** interact to affect ***learning outcomes*** for students engaged in an online learning task?

- Now:
 - **How can ‘flow’ be measured in the context of an online simulation?**
 - **What is the relationship between moments of ‘flow’ and moments of learning?**

- Today...

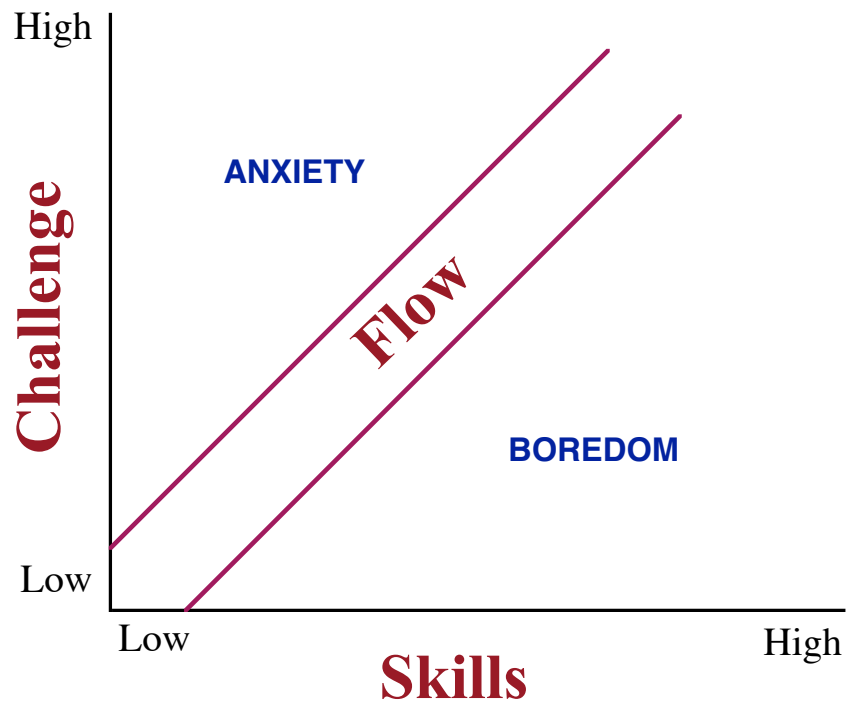


Justification

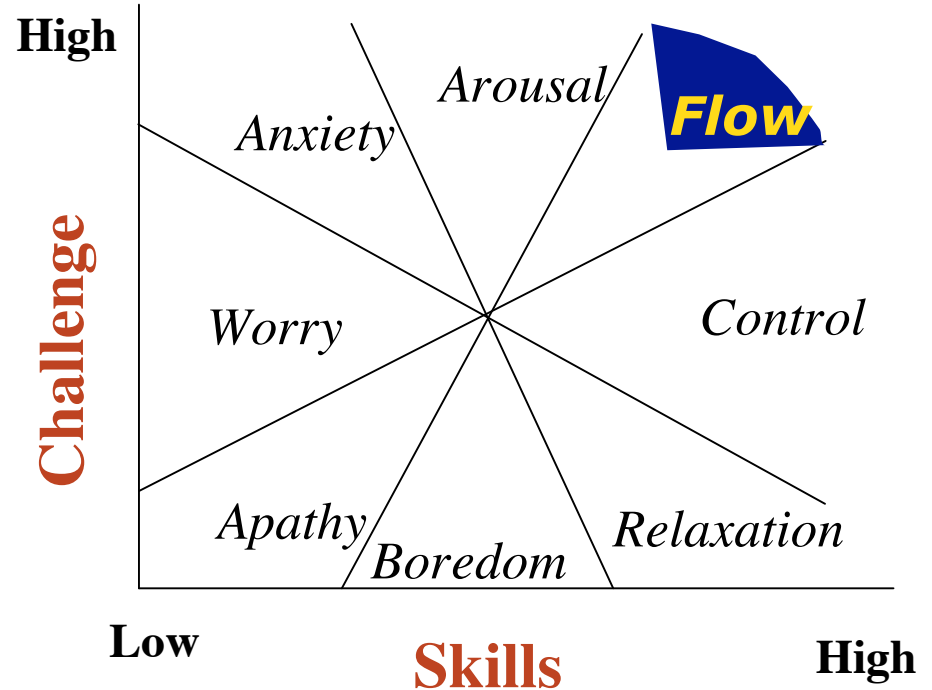
- We know about *control* and *learning*...
- We know about *control* and *flow*...
- With respect to online learning, we don't know:
 - **how flow relates to learning**
 - **what encourages flow**
 - **how to measure flow.**



Models of flow



“3-channel model”



“8-channel model”



An experiment

■ Aims

- **explore learning, flow, control**

■ Lab experiment

- **subjects**
- **tasks: “simulation” + “movie”**
- **tests**
- **skill/challenge measures**
- **post survey: enjoyment, control, engagement**

You have now completed *an activity*.
Before you continue please answer the following...

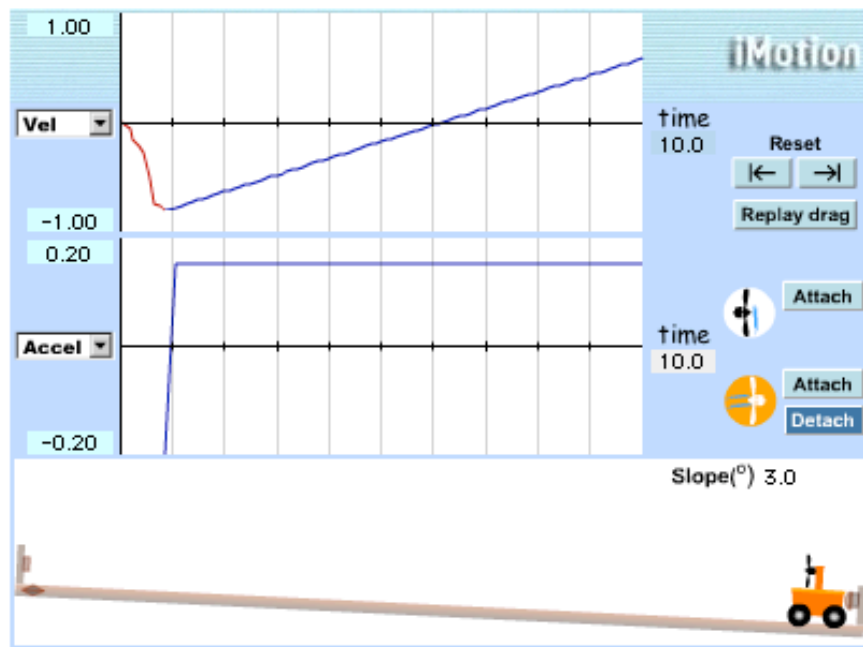
(a) How **challenging** did you find this last activity?

challenge too low challenge just right challenge too high

(b) Were **your skills** appropriate for understanding this last activity?

my skills too low my skills just right my skills too high

Constant acceleration



Jump to exercise...

1 2 3 4 5 6 7 8 9

Activity 6: Slowing down, other way - checking

Set up the simulation by attaching a fan to the cart that will apply a force on the cart towards the *right* (click the *lower* fan 'Attach' button).

(a) Give the cart a gentle push to the left. Make sure that the cart does not go so far as to bounce off the far end of the track.

(b) For the time while the cart is travelling to the left, sketch the blue parts of the **velocity-time** and **acceleration-time** graphs on top of your predicted ones *using a different coloured pen*.

(c) **Now again think** about how your **velocity** and **acceleration** graphs compare. By now you should be getting a picture of how a constant force affects motion - no matter in which direction the cart moves, and no matter what its initial speed is. Play around a little; jot notes if you want to.

You have now completed *an activity*.

Before you continue please answer the following...

(a) How **challenging** did you find this last activity?

challenge too low challenge just right challenge too high

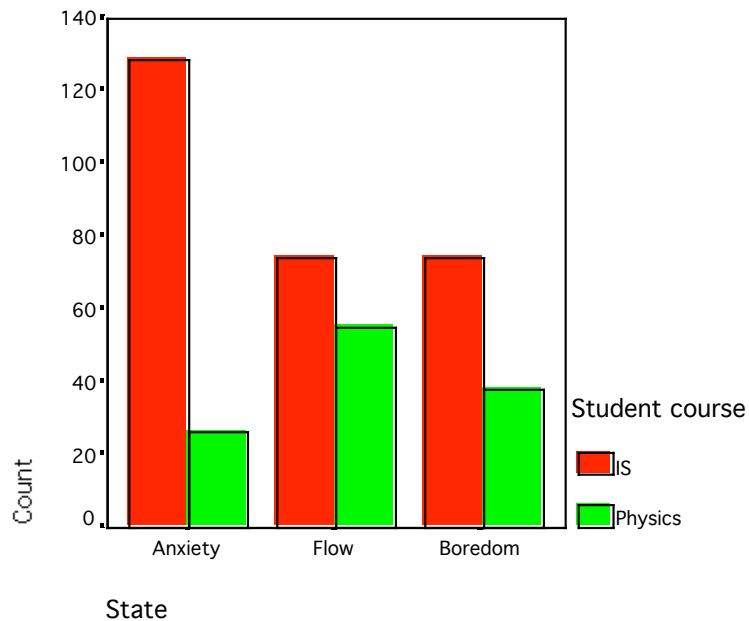
(b) Were your **skills** appropriate for understanding this last activity?

my skills too low my skills just right my skills too high



Analysis - 'instances of flow'

- Comparing Physics and IS students:



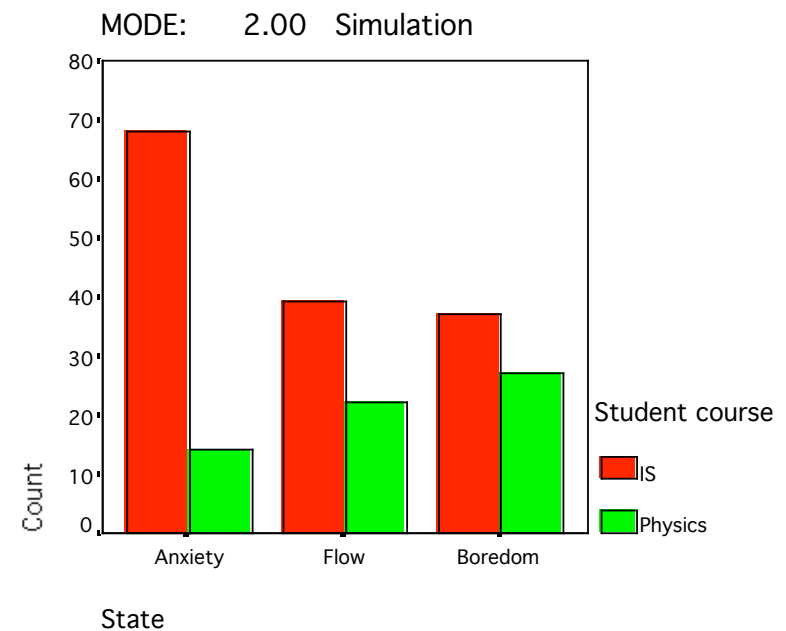
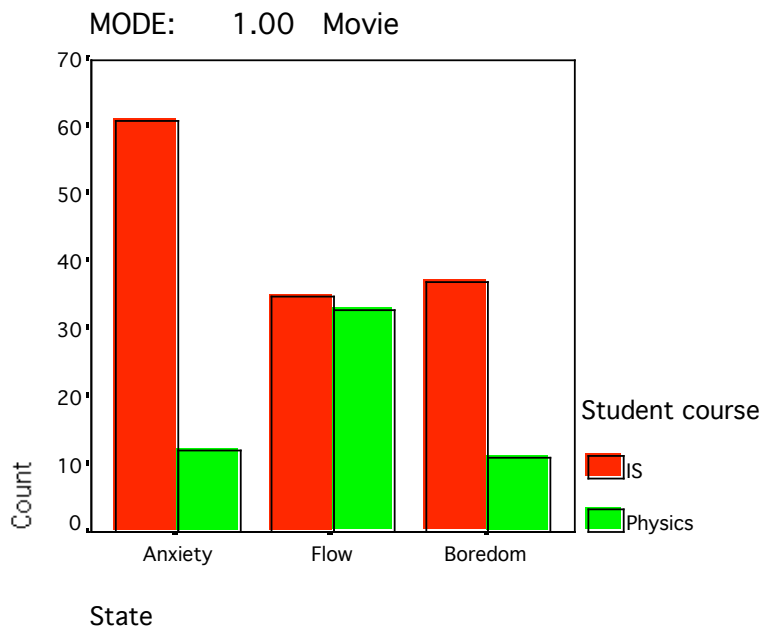
- IS tend to *anxiety*
- Physics tend to *flow*

(Using Csikszentmihalyi's 3-channel model)



Analysis - 'instances of flow'

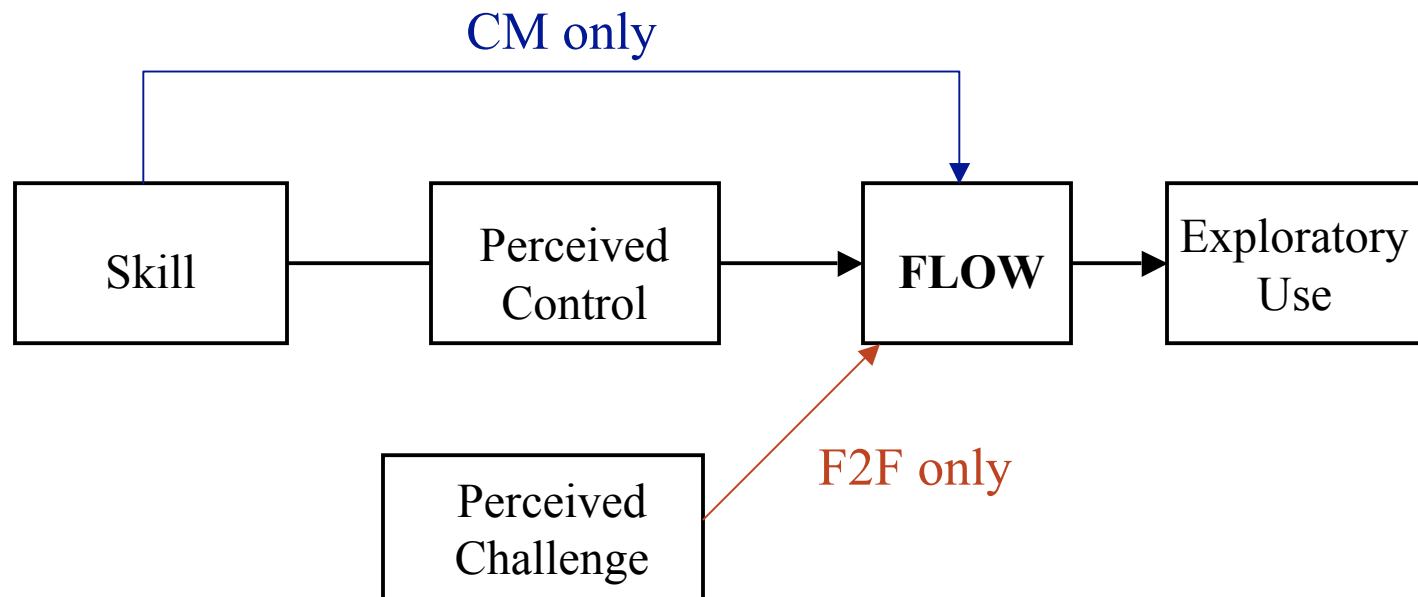
- Comparing Movie and Simulation students:



- **Physics 'movie' more likely to flow than 'simulation'**



An alternative look at flow



CM: computer mediated

F2F: face-to-face

(Ghani, ICIS, 1991)



Analysis - post-survey

- Using $flow = enjoyment + engagement$

or $flow = enjoyment + engagement + control$

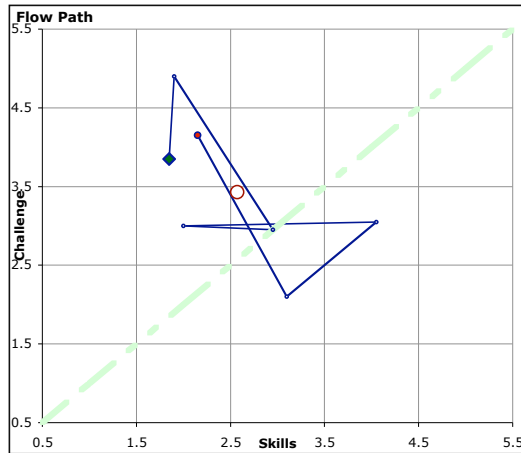
suggests that *sim groups* flow more than *movie groups*!

(Physics group not sig, IS 0.08 sig)

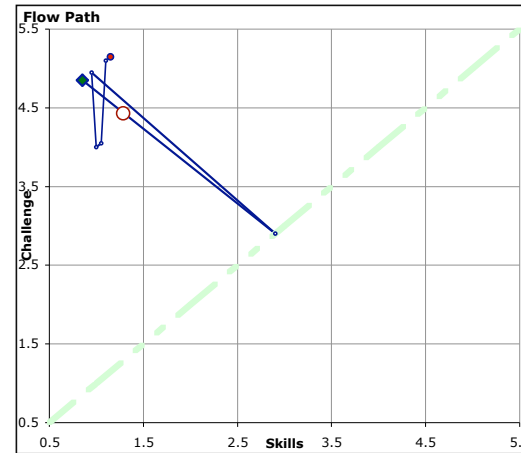
- Suggests ...?



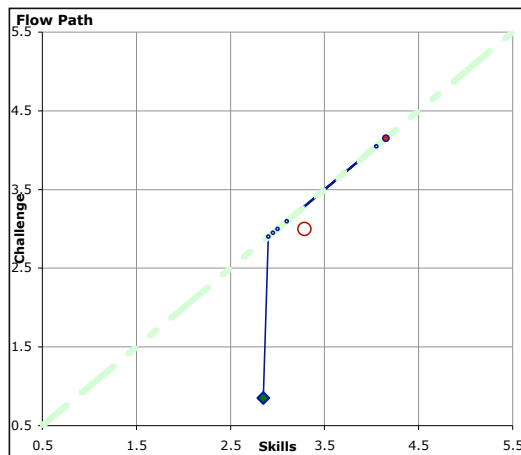
Other views: paths & retrospect'y



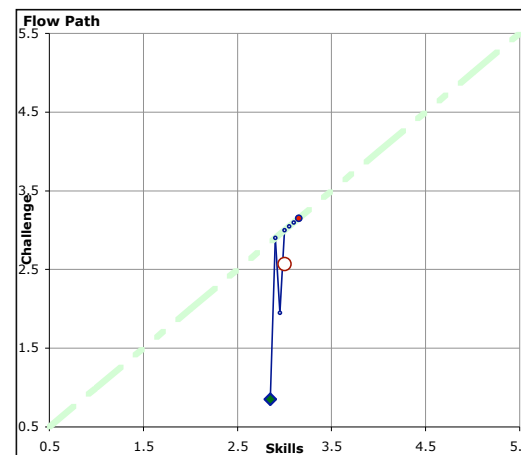
Typical
Med/low
flow



Extremely
low flow



High flow



Extremely
high flow



Next...

- Follow-up experiment:
 - **revised learning materials**
 - **8 students**
 - **videoed sessions in usability lab**
 - **learning + teaching + interview**
 - **focus on understanding student interactions**



Conclusion

- Other issues
 - **Learning outcomes**
 - **Interactivity**
 - **Control**
- Flow is a very complex concept to measure.