

Games Academy: BSc(Hons) Computing for Games

1: Introduction to Computing

Learning Outcomes

- ▶ **Recognise THREE** of the key challenges associated with your first block of study
- ▶ **Identify** approaches to managing time
- ▶ **Recall** important theories about teamwork
- ▶ **Recall** important theories about learning computer programming

Challenges in Higher Education

Challenges in the Transition to Higher Education

Students encounter many challenges when setting out on computing courses, however these are the three that I observe most often:

- ▶ Time management
- ▶ Teamwork
- ▶ Programming

TwitterFall Activity

- ▶ Self-organise into **THREE** groups
- ▶ Load a Twitter app, or login to Twitter on a PC
- ▶ Research and discuss tips on:
 - ▶ **time management**
 - ▶ **teamwork**
 - ▶ **learning programming**
- ▶ Tweet your tips!
- ▶ You have 15 minutes
- ▶ Please use the hashtag for the module (i.e., *#comp110*)
- ▶ Also please ensure you use the @ symbol to open and continue discussions

Time Management

Common Pitfalls

Among others, common pitfalls include:

- ▶ Not setting a goal
- ▶ Failing to identify tasks that need doing
- ▶ Poor track of tasks done and tasks outstanding
- ▶ Poor prioritisation
- ▶ Lack of scheduling
- ▶ Not starting tasks immediately

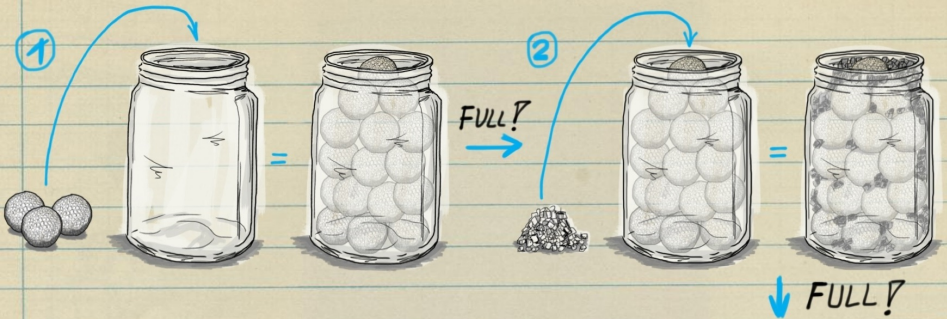
Common Pitfalls

Among others, common pitfalls include:

- ▶ Not committing to at least 40-hours per week
- ▶ Inability to say 'no'
- ▶ Multi-tasking inefficiency
- ▶ Procastination
- ▶ Crunching
- ▶ Sleeping too much

Overcoming the Pitfalls

- ▶ The trick is recognising the volume of work and planning ahead
- ▶ It is easier to motivate yourself to get small well-defined tasks out of the way, then to tackle nebulous and seemingly insurmountable tasks.
- ▶ Grasping a sense of flow and consistency is critically important



In the jar of life there is always room for a couple of beers with friends!

MANAGE

Crises & Pressing Problems

1

DEMAND + NECESSITY
DAILY FIRE-FIGHTING
BE QUICK TO DELEGATE

IMPORTANT AND URGENT

FOCUS

On Strategies & Values

2

OPPORTUNITY + PLANNING
KEEP CRITICAL THINKING
CONSIDER THE MACRO

IMPORTANT NOT URGENT

AVOID

Interruptions & Busy Work

3

ILLUSION + DECEPTION
NOT YOUR EMERGENCY
MINIMIZE INVESTMENT

URGENT NOT IMPORTANT

LIMIT

The Trivial & Wasteful

4

ESCAPE + WASTE
ENTERTAINMENT ONLY
USE TO MINIMIZE STRESS

NOT IMPORTANT OR URGENT

Teamwork

Value of Collaboration

Games are made by teams of people working collaboratively, bringing people from different disciplines come together to make different kinds of contribution.

Advantages include:

- ▶ Fostering a mix of skills that go beyond the capabilities of a single individual
- ▶ Faster problem solving
- ▶ Broader range of experiences and learnings from which to generate ideas
- ▶ More person-hours enables teams to tackle more ambitious goals

Value of Collaboration

Other advantages include:

- ▶ Organisational learning, sharing discoveries and insights across team members to increase productivity
- ▶ Sense of camaraderie and belonging aids motivation
- ▶ Mutual quality assurance and verification
- ▶ Robustness—support mechanisms and flexibility when life happens to get in the way

Difficulties

At first, everyone finds working with other people challenging. Common difficulties include:

- ▶ Remembering names and individual differences
- ▶ Nobody trusting each other
- ▶ Differing vocabularies and contrasting perspectives
- ▶ Everyone is coming in with different personalities
- ▶ People have different beliefs and positions regarding the way things *should* be done
- ▶ Members of the team will have different skills with varying levels of competence
- ▶ Emotional labour needed to forge relationships with new people

Expect Challenge

First-year teams always experience significant challenge!

Your team might fall apart and fail. If so, embrace the situation and reflect deeply—it's a learning experience (and you won't fail the course so don't worry)!

This first block of study is about recognising points of failure and resolving conflicts. It is your space to develop tolerance, coping mechanisms, new ways to communicate, and management skills.

Tuckman's Model

Teams go through various phases:

- ▶ Forming
- ▶ Storming
- ▶ Norming
- ▶ Performing
- ▶ Adjourning

You should **expect** conflicts and fall outs whilst *storming*. Part of being a professional is developing professional conduct—not over-personalising criticisms and disagreeing with peers in a constructive and polite manner. For more insight, see:

http://faculty.wiu.edu/P-Schlag/articles/Stages_of_Small_Group_Development.pdf

Belbin Roles—Thinkers

People have different role preferences. Some people are:

- ▶ **Plant:** Plants are creative, unorthodox and generators of ideas.
- ▶ **Monitor Evaluator:** fair and logical observers and judges of what is going on in the team
- ▶ **Specialist:** passionate about learning in their own particular field; as a result, they are likely to be a fountain of knowledge on a particular topic and will enjoy imparting this knowledge to others.

Belbin Roles—Actioneers

People have different role preferences. Some people are:

- ▶ **Shaper:** a task-focused individual who pursues objectives with vigour.
- ▶ **Implementer:** takes their colleagues' suggestions and ideas and turns them into positive action.
- ▶ **Completer-Finisher:** a perfectionist and will often go the extra mile to make sure everything is 'just right' and the things she or he delivers can be trusted to have been double-checked and then checked again.

Belbin Roles—Socialisers

People have different role preferences. Some people are:

- ▶ **Co-ordinator:** the likely candidate for the chairperson of a team, since they have a talent for stepping back to see the big picture.
- ▶ **Teamworker:** the oil between the cogs that keep the machine that is the team running smoothly. They are good listeners and diplomats, talented at smoothing over conflicts and helping parties understand one another without becoming confrontational.
- ▶ **Resource Investigator:** gives a team a rush of enthusiasm at the start of the project by vigorously pursuing contacts and opportunities.

Belbin's Inventory

- ▶ Team composition matters—two people with preference for the same role will likely come into conflict
- ▶ Role preferences matter—e.g., people with a strong completer-finisher preference typically won't do well with early-stage ideation tasks, deploy a plant instead
- ▶ Utilise talent—let people play to their strengths, and value their contribution (don't neglect teamworkers)
- ▶ People have multiple preferences with varying strengths—some people are more versatile than others, but everyone makes critically important contributions
- ▶ Preferences can change over time

Salas' Big-5 Model

In teams, it's important to openly communicate and develop strategies to support each other. Salas' approach focuses on those coordinating mechanisms associated with team effectiveness, indicating where you should focus your efforts:

- ▶ Closed-Loop Communication
- ▶ Mutual Trust
- ▶ Shared Mental Models

Salas' Big-5 Model

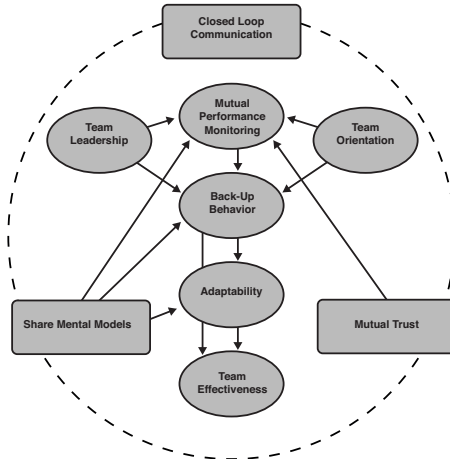


Figure: Five-Factor Model of Team Effectiveness with Coordinating Mechanisms (from Salas, 2005)

Salas' Big-5 Model

In order to be effective as a team, you need to:

- ▶ Orient yourselves towards a shared goal
- ▶ Identify your coordinator(s) and monitor-evaluator(s) to establish leadership
- ▶ Collectively devise an approach to mutual performance monitoring
- ▶ Develop back-up behaviours for when things go wrong
- ▶ Adapt

These typically have to be learned practically, and so we have the rest of the week to focus on these!

Learning Programming

Learning Programming

- ▶ Games industry is fast-moving, rapidly adopting new technologies
- ▶ Programming languages and APIs change, so you will continue learning throughout your career
- ▶ A goal of this course is to facilitate your development as self-regulated learners
- ▶ Gradually, more independence across each year of study
- ▶ This is a science degree, which means you will become a producer of knowledge, not just a consumer of knowledge!

Learning Programming

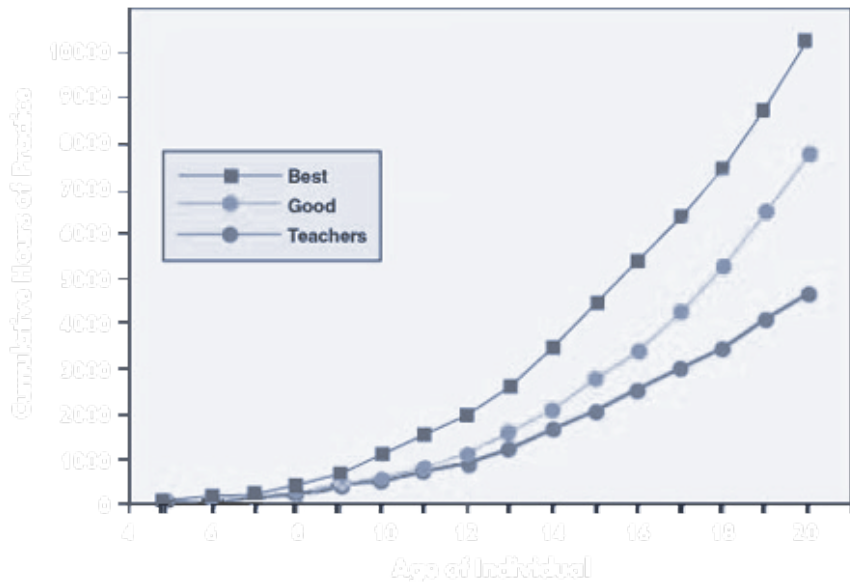
- ▶ It isn't easy!
- ▶ Most of you will encounter programming anxiety
- ▶ Some will experience a sense of fear or a sense of hopelessness — it is more common than you think
- ▶ Some will need more support than others — this isn't a bad thing
- ▶ Everyone who puts in the time and effort will achieve mastery, eventually

Key Learning Theories

- ▶ Deliberate Practice
- ▶ Scaffolding and the Zone of Proximal Development
- ▶ Schema Development
- ▶ Cognitive Load
- ▶ Learning Edge Momentum
- ▶ Mindset
- ▶ Neuroplasticity
- ▶ Self-Determination

10,000 Hours of Practice

Those identified as most gifted were also most practiced

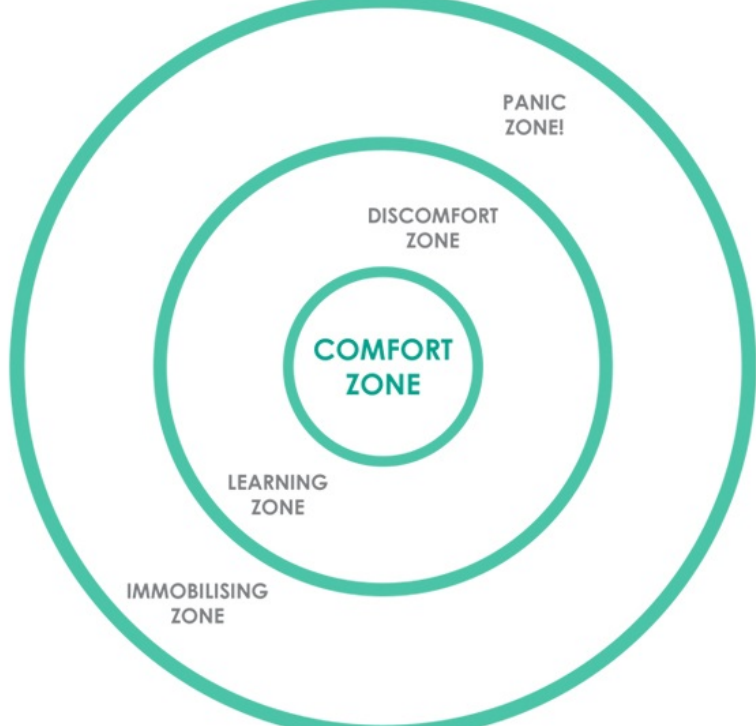


Deliberate Practice

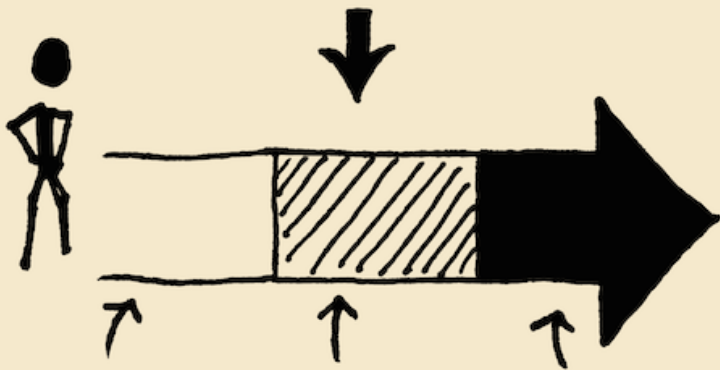
“Attention to the task: It is essential to pay fixed attention. The more a student’s mind wanders, the less the rate of change. Even videogames require the subject to stay ‘locked in’ to the content and the process.”
(Jensen, 2006, p. 82)

Deliberate Practice

“Low to moderate stress: This variable is quite slippery because what is stressful for one may not be stressful for another. The bottom line is that the subject must perceive some choice or control over the task and the surrounding conditions. Otherwise, the stress from that loss of control may neutralize the positive effects from the learning.”
(Jensen, 2006, p. 82)



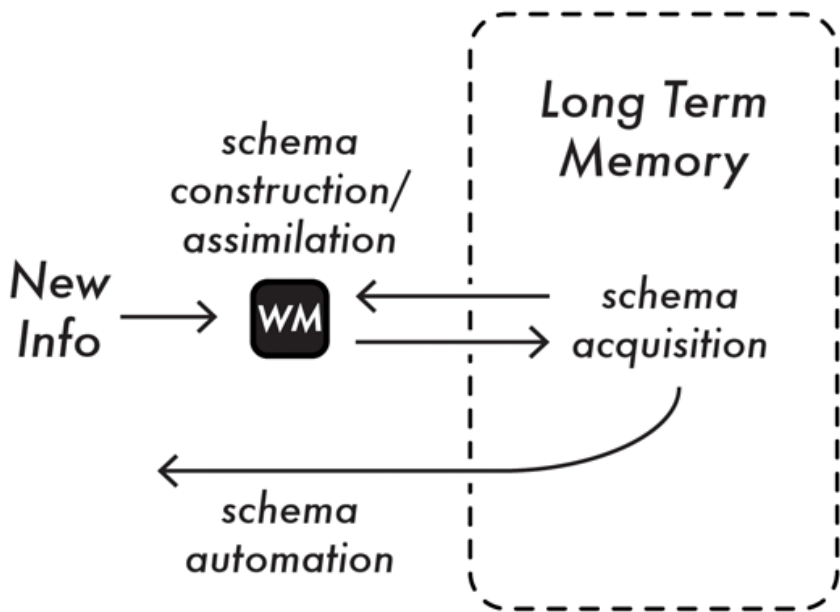
PROXIMAL DEVELOPMENT



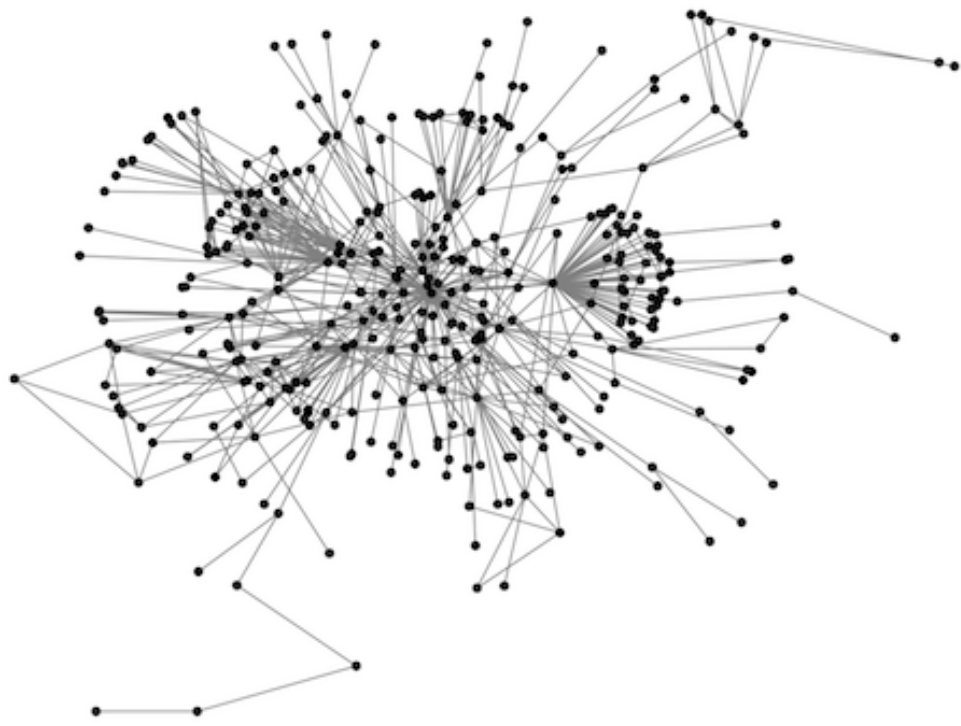
THINGS YOU CAN
DO ALL ON
YOUR OWN

THINGS YOU
CAN DO WITH A
BIT OF HELP

THINGS YOU CAN'T
YET DO, NO MATTER
HOW MUCH SUPPORT
YOU GET







Mindsets

Watch the video at:

[https://www.dropbox.com/s/8wy1mbkud7n5ns3/
Growth%20vs%20Fixed%20Mindset.mp4?dl=0](https://www.dropbox.com/s/8wy1mbkud7n5ns3/Growth%20vs%20Fixed%20Mindset.mp4?dl=0)

(5 minutes)

I'VE MISSED MORE THAN
9000 SHOTS

IN MY CAREER.

I'VE LOST ALMOST
300 GAMES.

26 TIMES, I'VE BEEN TRUSTED
TO TAKE THE GAME WINNING
SHOT AND MISSED.

I'VE FAILED OVER AND OVER AND OVER
AGAIN IN MY LIFE.
AND THAT IS WHY

I SUCCEED.

MICHAEL JORDAN



Neuroplasticity

Medina (2008) demonstrates:

- ▶ **Neuroplasticity:** the ability of the brain to reorganise itself and create new circuits in response to our environment and, perhaps most remarkably, in response to our thoughts
- ▶ **Life-long plasticity:** scientists discovered decades ago that the human brain remains plastic throughout our lives
- ▶ **New Nuron Growth:** more recent research shows that stem cells in the brain can grow new neurons at any age (i.e., Gage, 2002).
- ▶ **Epigenetics:** no such thing as a 'geek gene', considerable variance in *gene expression*

Neuroplasticity

Medina's (2008) also notes the following 'brain rules':

- ▶ Exercise: Physical health matters.
- ▶ Survival: Human brain evolves, too.
- ▶ Wiring: Every brain is wired differently.
- ▶ Attention: The brain won't pay attention to boring things.
- ▶ Short-term Memory: Repeat to remember.
- ▶ Long-term Memory: Remember to repeat.

Neuroplasticity

Medina's (2008) also notes the following 'brain rules':

- ▶ Sleep: sleep well, think well.
- ▶ Stress: anxiety impairs learning.
- ▶ Sensory Integration: Try to stimulate all of your senses.
- ▶ Vision: vision trumps the other senses.
- ▶ Exploration: humans are natural explorers, nurture this.



Homework

Take notes on Randy Pausch's Lecture on Time Management and share insights on Twitter:

<https://www.youtube.com/watch?v=oTugjssqOT0>

Remaining workshop time.