

# Skills of a mathematician

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# What are transferable skills

- The QAA Benchmark Statement for Mathematics, Statistics and Operational Research (MSOR) suggests skills MSOR graduates possess should include:  
"general study skills, ... ability to learn independently ... work independently ... pursuing the solution of a problem to its conclusion ... time-management and organisation ... adaptable ... able to transfer knowledge from one context to another, to assess problems logically and to approach them analytically ... highly developed skills of numeracy ... general IT skills ... general communication skills, such as the ability to write coherently and communicate results clearly" (p. 11).

# Why transferable skills

- Mathematics graduates require not only the subject skills but also transferable skills needed to “use their knowledge effectively”
- Applied mathematicians (e.g. scientists, engineers, economists, actuaries ...) “will be working with others, using mathematics and mathematical modelling to solve problems and answer questions that may arise in industry, commerce or a social context”
- Pure mathematicians will need to “conduct research and to teach”
- “Schoolteachers will certainly need good interpersonal and leadership skills”
- “Some mathematics graduates will go into general employment, and they, like their peers will need all of the aforementioned transferable skills”

Source: Challis, et al (2002)

# Why transferable skills

- It is because of their skills that MSOR graduates "find employment in a great variety of careers and professions" (QAA, p. 11).
- Mathematics graduates "play an important role in meeting the demands of employers for skilled personnel to ensure the UK can maintain its competitive edge in a global market" (Hibberd, p. 6).

# What do employers think?

- Lowndes and Berry (2003): “employers have voiced their perceptions/criticisms that students/graduates are technically competent but lack professional skills, awareness of business issues, communication skills and the problem solving skills needed to tackle complex real problems.” (p. 20).
- Challis et al report the findings of an employer survey which "suggested that a mathematics graduate is advantaged by being logical, systematic and rigorous, being able to take an abstract and broad approach, and being analytical, clear thinking and fast to understand. On the negative side, mathematics graduates tended to lack presentation and communication skills (including report writing and presentation to a non-technical audience), pragmatism in real problem solving, social skills and commercial awareness" (p. 81).

# Lucky NTU students

- Employers think you will lack transferable skills that you need to apply your mathematical knowledge
- To be a strong candidate for employment, you need a way to write a CV and walk into a job interview with evidence that you do have skills employers will expect that you lack
- Luckily for you, you are doing **Problem Solving!**

# References

- QUALITY ASSURANCE AGENCY FOR HIGHER EDUCATION, THE, 2002. *Subject benchmark statements: Academic standards - Mathematics, statistics and operational research*. Gloucester: The Quality Assurance Agency for Higher Education.
- CHALLIS, N., GRETTON, H., HOUSTON, K., and NEILL, N., 2002. Developing transferable skills: preparation for employment. *In: P. KAHN, ed. and J. KYLE, ed., Effective Teaching and Learning in Mathematics & its Applications*. London: Kogan Page, 2002, pp. 79-91.
- HIBBERD, S., 2005. Use of Projects in Mathematics. *MSOR Connections*, 5(4), pp. 5-12.

# Task

- Work out the answer and be ready to justify it

# How did you get on?

- What roles did you each take in the task?
- Did one team member take charge? Who had the good ideas? Who sorted out disagreements?
- I am going to ask you to appoint a Chair and a Minutes Taker
- What characteristics should a Chair have?

# Personality types and similar tests

- It is horrible and unreliable to pigeonhole people into personality types
- But can be a useful simplified model (like a lot of things)
- Look at the handout
- We won't do the relevant quiz, but have a look at the roles
- Which did you take in the task today?
- Which do you tend to take on?

# Weekly meetings

- During Task 3 parts 1-3, you will hold a team meeting each week
- Each meeting will review the minutes of the previous meeting, check what work has been completed against each **Action** and assign new Actions
- If you cannot attend, you must send a note of apology (e.g. an email) to be presented at the meeting

# Minutes

- Provide an accurate record of what happened in the meeting, what each team member has done since the last meeting and what Actions they are assigned for the next period
- Hold your meeting at the start of the relevant class
- The minutes must be typed up within the class and agreed by all team members as an accurate record of the meeting
- See sample minutes

# Minutes

- Minutes will be collected after each team meeting and will form a component of the assignment (e.g. marks will be awarded)
- If your team does not submit minutes your mark will be reduced
- If a team member frequently does not attend meetings or the minutes say they are not completing work, that team member may receive a reduced share of the team mark

# Team structure

Decide now in your group who will take the roles:

- **Chair**
  - in charge of the meeting, responsible for making sure everyone answers to their actions
  - confident, good communicator, delegates well, keeps the group on task
- **Minute taker**
  - keeps a record of the meeting and records actions and work completed
  - good attention for detail, conscientious, trusted by all
- Both must be reliable (i.e. likely to turn up each week!)

# Maths

- Come back tomorrow and we'll do some real maths!