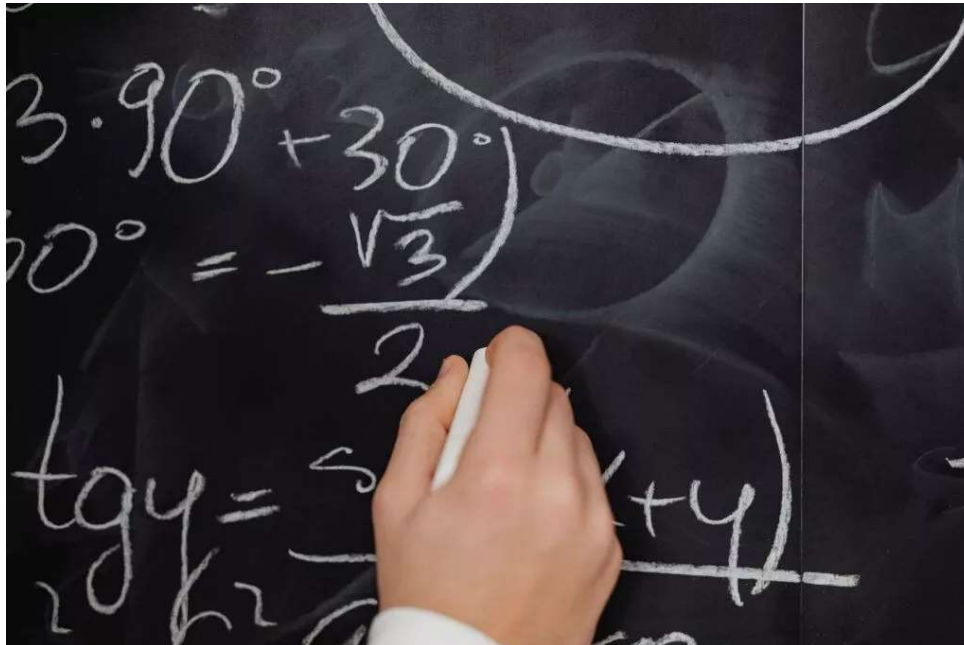


Unleash your inner geek: using maths to prepare graduates for a data driven future

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What makes an effective clearing campaign? To answer this, we
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A number of present examples, domestically and around the world,
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The need for quantitative and analytical skills in the modern business environment is growing as companies attempt to leverage data, analytics and AI to improve everything, from customer relationship management and marketing to human resource management, planning and finance. Business schools therefore need to connect to this current and rapidly evolving space, but the challenge is a difficult one.

Data driven organisations are the future of business, and employees need to be able to foster data driven decision making and the tools that enable it. The age of solely using common sense and previous experience is rapidly shifting because:

- Data availability is growing exponentially, as well as the challenge and complexity of understanding it; common sense is not enough, and the need for using quantitative methods and software to explore and interpret data grows.
- Rapid change in competitive marketplaces often makes previous experience obsolete, and more decisions should be made based on anticipation or projections of future consumer actions rather than on past archives. This calls for continuous and up to date data collection and analysis.

The problem is that many students and employees still find themselves avoiding mathematics and find new software learning onerous and highly time consuming. Integrating analytics into workflows often needs to happen in an organic way where the will and desire of the employee to engage is as important as the tools and the data. Even at a low-level, employees need to be able to work with business analysts and understand the pitfalls of data management.

In business schools we have the opportunity, expertise, resources and time to facilitate this journey, but first we need to understand some of the drivers. Mathematical anxiety is a pernicious driver as it is a self-reinforcing phenomenon, where any failure leads to further anxiety making further failure more likely. Thus, we need to:

- be empathic and accentuate the wins while minimising the mistakes
- understand this can be a deeply personal challenge
- foster a growth mindset
- mark on process and not on right or wrong
- emphasise process and minimise the performance orientation
- avoid demanding performance above the students current learning
- foster a culture of risk taking and show it is OK to make a mistake

To reduce the learner's mathematical anxiety, it must be recognised that this anxiety is personal and unique to each individual. This means that a one size fits all model will not meet the needs of each learner. Recognising this allows the provider to map the opportunities, expertise, resources and potential time needed for each individual learner to develop their mathematical competences at their own pace. The bespoke nature of this learning can provide a number of challenges in a classroom setting, particularly when large numbers of learners are involved. However, this can be scaffolded by:

- Mapping the available resources and expertise available to the learner so that the full mathematical 'offer' is clearly articulated to the learner at the start of the learning process
- Provide the opportunity for each individual learner to audit their level of mathematical competence
- Provide the opportunity for each individual learner to audit, acknowledge and express their level of mathematical anxiety at the start and during of the learning process
- Provide the opportunity for each individual learner to audit their level of desire and will learn mathematical skills and demonstrate clear incentives for learning
- Use successful corporate generated resources and learning packages that support the learner understanding and ability to try out their skills, for example LinkedIn Learning
- Provide peer to peer mentoring and role models who have achieved their learning outcomes despite initial anxieties

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Studies of the teaching of analytics have come mainly from those based in statistics departments at universities. Even here though they recognise the need to be teaching far more than just basic statistics skills. There is a need for:

- soft skills such as communicating results and eliciting needs
- design and visualisation skills to display and present results in compelling ways
- telling stories with data that speak to employees, suppliers and customers
- critical thinking and applied analysis skills

The other problem is that students have often come from a school environment where they have learned to 'switch off' when learning mathematics as they consider it dry and boring and do not see the need for learning it. So, we should:

- Be more selective when recruiting students and pay a special attention to their scores on previous quantitative modules, as well as on standardised admission tests such as GMAT (or equivalent for undergraduate students).
- Start early with basic quantitative notions – as soon as the student comes into the business school environment
- Follow-up in 2nd and 3rd year with more advanced quantitative methods
- Use data and industry examples to show the use and business advantage afforded by using data and analytics
- Get students involved in practical and real research projects sponsored by companies, so the students realise how valuable and useful is quantitative research for companies.

In summary, it is possible for us to make the journey into quantitative skills for business more enjoyable and relevant, but we need to:

- Begin early
- Use real world examples as motivation: guest speakers and data stories
- Have fun by using open learning environments which foster risk taking and a growth mindset
- Utilise the other important 'soft' skills where those weak in quantitative skills can excel, such as visualisation, storytelling, and design
- Teach concepts first to build familiarity with critical thinking and analysis skills
- Be empathic, math anxiety is real and a highly debilitating for many students

For us, this demonstrates a connected business school to the histories of students, their futures, and how organisational life is unfolding through technological innovation and disruption.

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