



MAKING MATHS ACCESSIBLE AND RELEVANT VIA YOUTUBE AND SOCIAL MEDIA

BENEFITS

- Engaging a wide audience online.
- Directly responding to your audience and its needs.

TIPS

- Just go for it! The key thing to remember is that you can't get better if you don't start somewhere!
- Working hard and a willingness to learn from others will help you succeed.
- Making high-quality material is key.

TOOLS USED

- YouTube
- Social Media

Abstract

YouTube and other Social Media platforms provide new opportunities to engage a wider audience in your work and research. This case study demonstrates how increasing interaction with your audience can lead to a successful online conversation about your subject and its relevance in society. Two aspects in particular are highlighted in this case study: involving your audience in content creation and producing high quality content that resonates with your audience.

Conveying the importance of Maths

Many see Maths as a boring, serious or irrelevant subject. However, Maths is an integral part of almost everything we do: from programming computers to predictions of climate change. Dr Tom Crawford, lecturer at St Hugh's College, seeks to help people to understand the subject's importance through his outreach programme, which is centred around his YouTube channel Tom Rocks Maths (Figure 1), his website and related social media channels. By



The most important aspect of my work is the innovative use of social media to increase audience participation and interaction with Maths.



– Dr Tom Crawford
Lecturer at St Hugh's College

making engaging video content, he aims to improve people's perception of the subject and to increase their involvement, engagement and enthusiasm towards Maths.

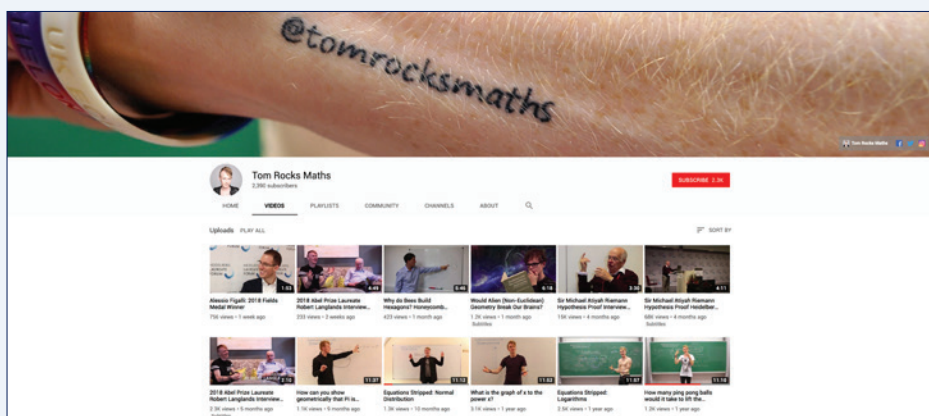


Figure 1: Screenshot of the Tom Rocks Maths YouTube channel.

Making Maths easy to pick up

The key concept that underpins his approach is to present the material as the answer to an interesting question. For example, a discussion of buoyancy force – the force that enables objects to float – is presented as part of the answer to: ‘How many ping-pong balls would it take to raise the Titanic from the ocean floor?’ (Figure 2). The audience is intrigued by the question and therefore watches the video in order to find out the answer, often without realising that they are learning Maths.



Figure 2: Screenshot of Tom giving the answer to an interesting question in one of his YouTube videos.

Actively engaging online audiences

Tom has developed an effective method for choosing the topics for his videos which largely relies on his audience's input (Figure 3):

1. **Call for questions on social media.** Members of the public are asked to submit a mathematical question that they would like to know the answer to. The call lasts around 1-2 weeks.

2. **Tom selects 3 questions.** He chooses questions based on how interesting/exciting they are and whether the mathematical concepts used to answer the question can be explained easily to a general audience.
3. **Vote on social media.** The 3 selected questions are uploaded to Tom's social media profiles where people are able to vote for their favourite. The vote is open for around 1 week.
4. **Tom answers question in video format.** The video answer is recorded, edited and uploaded to YouTube.

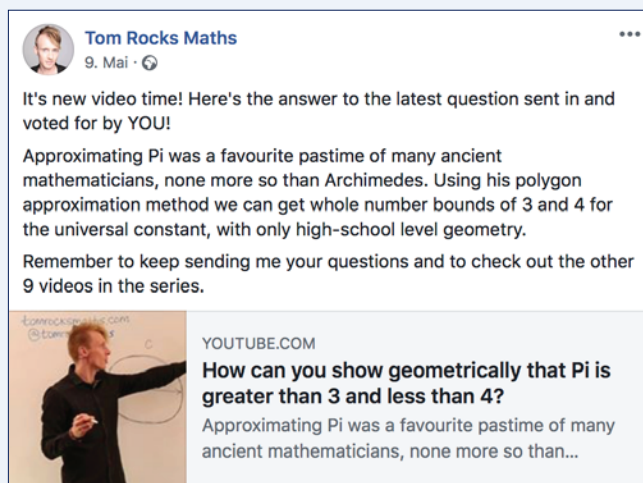


Figure 3: Screenshot from Tom's Facebook where he asks his audience to send in questions.

Audience participation is key to the video creation process. This increases engagement with the subject, ensures that the videos are relevant to the audience's interests and increases their investment in the outcome. By selecting the questions, Tom also ensures that the questions do not initially look like Maths problems. It is references to popular culture and everyday life that make his videos much more fun and engaging.

Adopting a not-so-serious approach to Maths

Tom is also very keen to combat the stereotype associated with mathematicians and as such has created his persona as the 'Naked Mathematician'. Videos in his 'Equations Stripped' series provide an overview of some of the most important equations in maths which people may have heard of, but do not really understand. The format of 'stripping back the equation layer-by-layer' allows for basic concepts and ideas to be covered first, before moving onto a more detailed examination of the individual terms and finally some mathematical calculations that are possible with the equation. During the videos, Tom removes one layer of clothing as each layer of the equation is 'stripped-back' to show that maths does not have to be taken as seriously as most people think!



I've always loved Maths but never wanted to go to university, but you've made me want to go now.



- Viewer's comment on Tom's YouTube channel

Generating understanding and a positive image

Tom's efforts to increase engagement, involvement and enthusiasm towards the subject of maths amongst the general public, and to provide a positive role model for anyone considering further study in the field, have been very fruitful so far. Viewers leave comments on his YouTube channel praising his work:

"I've always loved maths but never wanted to go to university, but you've made me want to go now."

"Wonderful! Thank you for sharing this. I'm reading Maths (1st year), and this is very helpful."

"I'm in 3rd year of a chemical engineering degree and I never knew what a logarithm was, I just used them. Thank you very much."

Besides this highly positive feedback, the number of followers also reflects the success of this initiative. The total number of views on Tom's YouTube channel has almost reached 250,000 and he already has more than 2000 subscribers. Alongside his teaching commitments at the University, Tom continues to focus on his public engagement and outreach work and pursues the development of his website.

Next steps

- Visit [Tom Rocks Maths on YouTube](#), take a look at his **website**, and his other social media channels:
 - **Twitter**
 - **Facebook**
 - **Instagram**
- Find out more about how you can use technology to enhance your teaching at www.ctl.ox.ac.uk.
- Contact our team of learning technologists at contact@ctl.ox.ac.uk.

Image credits: Header image by Tom Crawford; Students using phone by Robin Worrall on Unsplash; Students by Brooke Cagle on Unsplash; Working on laptop by Alexa Mazzarello on Unsplash

OxTALENT winners

Joint winner, OxTALENT 2018 award for Outreach. The text and images in this case study have been adapted from Dr Tom Crawford's entry for the OxTALENT competition.

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"I'm in 3rd year of a chemical engineering degree and I never knew what a logarithm was, I just used them. Thank you!"



- Viewer's comment on Tom's YouTube channel