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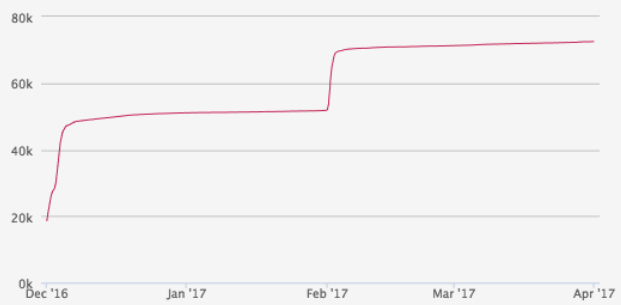

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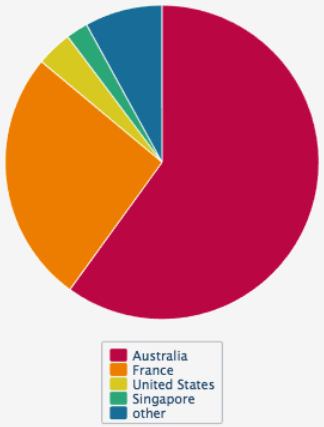

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What to say if your child asks 'what's the point of maths?'

OPINION

The Conversation By Kevin Larkin, Griffith University

Posted Thu 1 Dec 2016, 3:59pm

As a parent, or even teacher, you are likely to have been asked the question: "What's the point of maths?"

This is often followed by: "When will I ever use this stuff?" or "How will maths help me later in life?"

These questions, not often asked of other school subjects, indicate that for some children, maths is seen as something belonging only to school classrooms.

As parents it is not always easy to respond to questions such as these. Hopefully the answers provided below provide a way to start talking about maths.

The questions young people ask about maths often relate to their personal experience of how they found maths in school, rather than questions about maths per se.

Reports suggest that young people's negative attitudes towards maths are increasing, even as early as primary school. This is largely due to the maths being taught as a recipe.

If we do A then B then C we get the correct answer to a problem we didn't pose in the first place — and with little understanding of the ingredients.

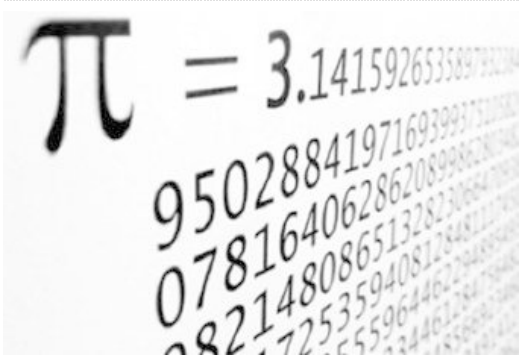

PHOTO: Young people's negative attitudes towards maths are increasing.
(Supplied: Constructive Mathematics)

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My research indicates that some eight-year-olds already identify as "not being a maths type of person", with children using words such as "anger", "sadness", "hatred" and "boredom" to describe how they feel about maths.

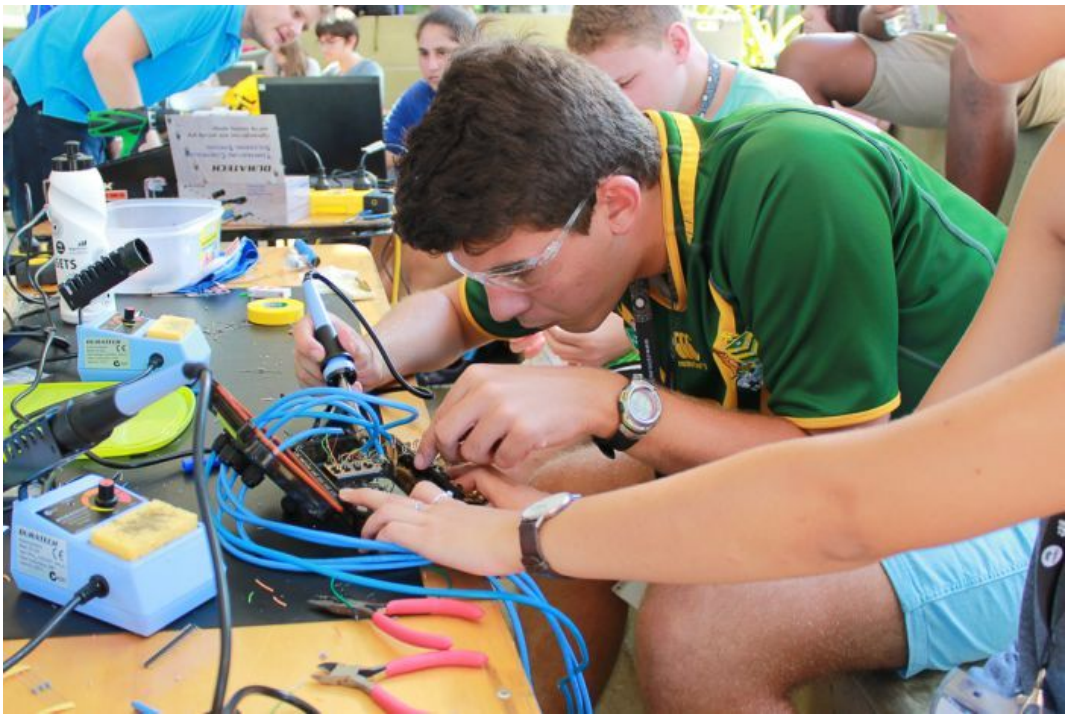

PHOTO: A student works on a sensor during the Aboriginal Summer School for Excellence in Technology and Science at James Cook University.
(ABC North Queensland: Kathleen Calderwood)

When will I ever use this stuff?

Maths in schools is largely skills-based — such as learning how to determine internal angles of shapes or using formulas to determine volume or capacity — rather than a study of what mathematics actually is.

Mathematics is a study of patterns and a means of representing and describing the world in terms of quantities, shapes and relationships.

This means that for many students, their understanding of mathematics is completing tasks set by a teacher rather than developing their own understanding of angles or volume or capacity.

An analogy I use with university students is that mathematics skills can be likened to playing a piano (keys, notes, strings, hammers). But knowing the parts of a piano does not make someone Mozart.

Likewise, knowing facts, formulas, and rules, while very important, do not make someone a mathematician.

Broadening the experience of maths beyond the completion of worksheets presents the subject as interesting, relevant and engaging. It also has long-term economic impacts for productivity and employment opportunities.

Teachers could look for opportunities for students to use maths beyond the prescribed daily lesson (for example, location and orientation activities while playing sport, or patterning while learning music, or using perspective in visual arts).

Parents could encourage their children to think about and use maths in every-day contexts.

For example, when travelling, children can look for patterns in car number plates (digits that are consecutive 3, 4, 5 or prime 2, 5, 7 or square 144).

They might predict which routes are quickest while using updated data on mobile devices, or determine how much of their favourite TV shows are devoted to advertising.

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How will maths help me later in life?

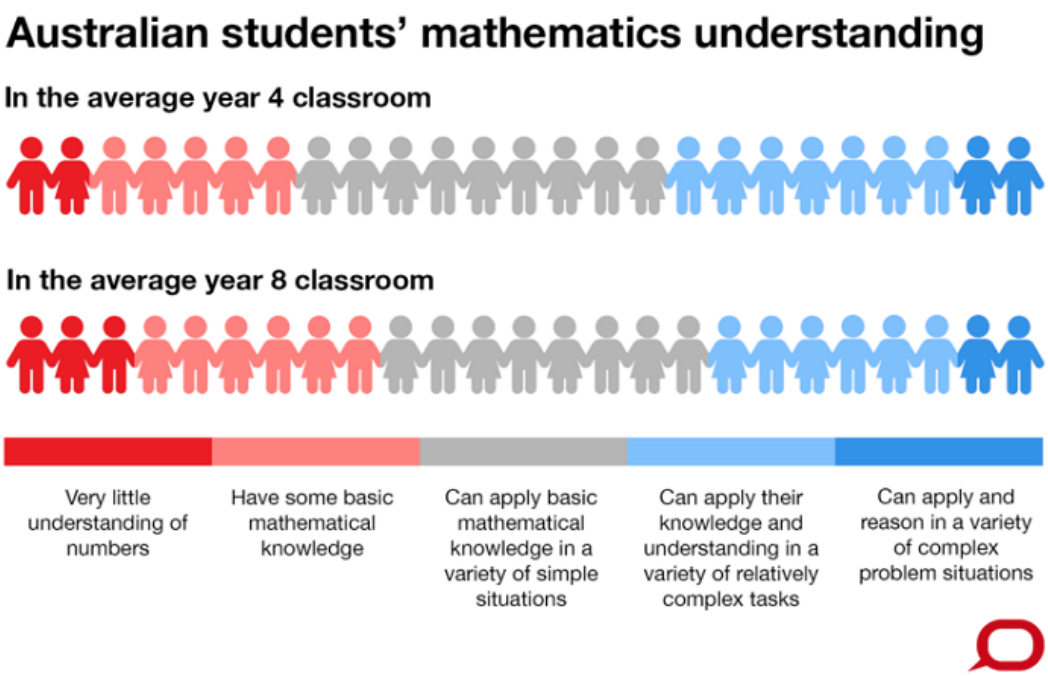
What is needed in our conversations with young people is a recognition that we use maths every day, perhaps without noticing it.

For example, when navigating, determining likelihood, measuring, estimating, or when listening to the statistics offered by politicians, salespeople or advertisers.

Because the focus on maths in schools is on skills, rather than solving authentic problems, young people are discouraged from further study in this area.

An overemphasis on the skills of maths (basic number facts, equations) at the expense of actually working as a mathematician (reasoning, problem solving, modelling, using technology) may then further disenfranchise young people and contribute towards the decline in the number of students studying maths in high school or at university.

Between 2000-2014, the percentage of students studying Advanced Mathematics fell from 11.9 per cent to 9.6 per cent and Intermediate Mathematics from 25 per cent to 19.1 per cent.



INFOGRAPHIC: TIMSS mathematics and science results 1995-2015. (Supplied: The Conversation)

A common misconception is that only a select handful of occupations use maths. But most occupations (for example, nurses, pilots, fashion designers, builders, journalists, truck drivers) use maths every day, often solving problems collaboratively.

Such skills are not assessed in international tests such as Trends in International Mathematics and Science Study (TIMMS) or Program for International Student Assessment (PISA), and never will be due to the narrow nature of these tests.

So what is the point of maths?

Next time your child asks what is the point of maths, my answer would be:

- that maths helps you to understand why things happen the way they do (why presents cost more at Christmas);
- predict what might happen in the future (using probability to work out how likely it will be that my favourite toy character will appear in a box of cereal); and
- solve puzzles to assist the heroine unlock the next level in the latest video game.

Kevin Larkin is a lecturer in Mathematics Education at Griffith University.

Originally published in The Conversation.

Topics: mathematics-education, education, government-and-politics, federal-government, access-to-education, educational-resources, australia

TIMSS: Australian schools fall behind

The latest TIMSS report shows that students in Australia make very little — if any — progress in maths from Year 4 to Year 8.

THE CONVERSATION
Academic rigour, journalistic flair

What to say if your child asks, ‘what’s the point of maths?’

December 1, 2016 3.38pm AEDT

Young people’s negative attitudes towards maths are increasing. from www.shutterstock.com

Author

Kevin Larkin

Lecturer (Mathematics Education), Griffith University

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“How will maths help me later in life?”

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Children Mathematics Students school curriculum Teachers Maths School Parents Trends in Mathematics and Science Study (TIMSS)

THE CONVERSATION
Academic rigour, journalistic flair

Que dire aux enfants qui se demandent à quoi servent les maths

February 2, 2017 7.46am AEDT

Pourquoi tant d'enfants détestent-ils les maths ? Shutterstock

Author

Kevin Larkin

Senior Lecturer (Mathematics Education), Griffith University

Translations

Read this article in French and English

En tant que parent – ou enseignant – vous risquez un jour d'être confronté à cette question : « Les maths, à quoi ça sert ? »

Une question souvent suivie d'une autre : « Quand est-ce que je vais m'en servir ? » ou « Comment les maths vont-elles m'aider dans la vie ? »

Ces questions, qui sont moins souvent posées à propos des autres matières, indiquent que pour certains enfants, les maths sont complètement déconnectées de la réalité et ne concernent que l'école.

En tant que parent, ce n'est pas toujours facile de répondre à ce genre de question. Mais voici quelques pistes qui vous permettront d'engager la discussion.

Ces interrogations sont en lien avec l'expérience personnelle des enfants, de leur pratique des maths à l'école, et ne sont pas vraiment dirigées vers les mathématiques elles-mêmes.

Certaines études montrent que de nos jours, l'attitude négative des enfants à l'égard des mathématiques a tendance à s'accentuer, et ce dès l'école primaire. C'est en grande partie parce que les mathématiques sont enseignées comme on enseignerait une recette.

Si l'on fait A puis B puis C, alors on obtient la bonne réponse à un problème que l'on a oublié de poser pour commencer – et sans permettre de comprendre les ingrédients qui le composent.

D'après mes recherches, dès 8 ans, certains enfants se déclarent « pas faits pour les maths » et utilisent des mots tels que « colère », « tristesse », « haine » et « ennui » pour décrire leurs sentiments à l'égard de cette matière.

« Quand est-ce que ça va me servir ? »

Les mathématiques telles qu'on les enseigne à l'école s'appuient essentiellement sur des compétences – comme la capacité à déterminer les angles de formes géométriques ou à utiliser des formules pour calculer un volume ou une capacité – plutôt que sur l'étude de ce que sont véritablement les maths.

Outre l'étude des modèles mathématiques, elles sont un moyen de représenter et de décrire le monde sous forme de quantités, de formes et de relations. Or pour beaucoup de jeunes, les maths consistent à résoudre des problèmes posés par un professeur plutôt qu'une façon de développer leur compréhension de la géométrie ou des volumes.

J'utilise souvent la même métaphore pour parler des compétences mathématiques à mes étudiants : pour moi c'est un peu comme jouer du piano : savoir qu'il y a des clés, des notes, des cordes et des marteaux n'aide pas à devenir Mozart. De même, connaître des faits, des formules et des règles, même si c'est très important, ne fera pas de vous un mathématicien.

Élargir l'expérience des maths au-delà des devoirs permet de rendre le sujet attrayant, pertinent et donne envie de s'y plonger. Cela a aussi un impact sur le long terme, en matière de productivité et d'opportunités d'emploi.

Les professeurs pourraient chercher des moyens d'inciter les enfants et les étudiants à utiliser les maths hors des cours (pourquoi pas en imaginant des activités d'orientation et de géométrie dans l'espace quand ils font du sport, le repérage de motifs récurrents quand ils font de la musique, ou l'usage de la perspective en arts plastiques).

Quant aux parents, ils pourraient aussi inviter leurs enfants à réfléchir en termes mathématiques et à utiliser les maths dans la vie quotidienne.

Par exemple, en voyage, les enfants peuvent chercher des motifs mathématiques sur les plaques d'immatriculation des voitures (chiffres consécutifs, nombres premiers…). Ils peuvent tenter de prévoir l'itinéraire le plus rapide avec leurs applications mobiles ou déterminer quel pourcentage de leurs émissions de télévision est consacré à la publicité.

« Comment les maths vont-elles m'aider dans la vie ? »

Au cours de nos conversations avec les jeunes, il faut insister sur le fait que nous utilisons les mathématiques tous les jours – peut-être même sans le remarquer. Par exemple, lors de nos déplacements, quand nous déterminons une probabilité, quand nous mesurons, estimons, quand nous examinons des statistiques proposées par les politiciens, les vendeurs ou les annonceurs.

Parce qu'on met trop l'accent sur les compétences mathématiques, plutôt que sur leurs applications concrètes, les jeunes se découragent. Mettre en avant les compétences en mathématiques (théorie des nombres, équations) au détriment du véritable travail des mathématiciens (raisonnement, résolution de problèmes, modélisation, utilisation de la technologie) contribue au déclin du nombre d'étudiants en mathématiques au lycée ou à l'université.

Entre 2000 et 2014, en Australie, le pourcentage d'élèves étudiant les mathématiques avancées est passé de 11,9 % à 9,6 % et ceux qui avaient atteint le niveau intermédiaire en mathématiques est passé de 25 % à 19,1 %. Une idée reçue veut que seule une minorité de professions utilisent les maths. Mais en réalité, la plupart des professions (infirmières, pilotes, créateurs de mode, constructeurs, journalistes, camionneurs) utilisent les mathématiques tous les jours, résolvant souvent des problèmes en collaboration avec les autres. Ces compétences ne sont pas évaluées dans le cadre de tests internationaux tels que le TIMMS (Trends in International Mathematics and Science Study) ou le Programme d'évaluation internationale des étudiants (PISA), et ne le seront jamais, au vu de leur cadre limité.

Alors, à quoi servent les maths ?

La prochaine fois que votre enfant vous demandera à quoi servent les mathématiques, vous pourrez répondre que les mathématiques aident à comprendre pourquoi les choses arrivent (pourquoi les cadeaux coûtent plus cher à Noël par exemple) ; à prédire ce qui pourrait arriver à l'avenir (en calculant la probabilité que la figurine de leur personnage préféré soit offerte dans une boîte de céréales) ; ou de résoudre des puzzles pour aider l'héroïne à débloquer le prochain niveau dans leur jeu vidéo de prédilection.

This article was originally published in English

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