Picturing Mathematics (Education) in New Ways

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Picturing Mathematics (Education) in New Ways

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Mathematics comes to most through the efforts of those who educate us in school during our learning years. This issue contains a variety of articles exploring not only how children learn mathematics, but how educators might gain a deeper understanding of concepts before jumping into the teaching world.

Vahap Yorgun and Serdal Mert start things off with a study on how math anxiety develops, explored through surveys given to Turkish high school students. Merlin Carl then explores what role automated proof checking has in helping math educators understand how proof works in mathematics.

Marion Cohen then takes us with her into her private world of Associative Arithmetics, showing how an abstract system can be built from the ground up. She also shares a poetic record of her process via limericks, offering us unique insight into the workings of the mind of a mathematician-poet.

Once a staple of a good mathematics education, compass and straightedge construction has been on the decline for the last few decades. Deborah Kent and David Muraki explore how the note-taking app Notability™ can be used to build these constructions digitally for a new generation of students and geometricians-in-training.

Jennifer Elder, Pamela Harris, and Anthony Simpson then show us how the run size of permutations of words varies across languages. Eryn Maher, Ha Nguyen, and Cynthia Tapia then tackle a tricky question: how to help the average person visually develop intuition for millions, billions, or trillions.
In our first Exposition, Andrew Powell takes us to the world of imaginary numbers, treating us to not only a plane description, but what happens when you move beyond two dimensions, always using geometry of the real plane as a guide. Michelle Cheng and Robert Laugwitz then show us how blanket patterns link back to group theory via braids and knots.

In our Mathematics and Society section, we have two neat articles for you. In the first, Christopher Perez offers us a mathematical model designed to introduce students to Marxist economics. In the second, Nicole Fletcher and B Waid then discuss how to build communities of care within math education through their personal experiences and reflections.

Our World of Mathematics articles continue this question of how to teach mathematics effectively. Jerzy Pogonowski has our first article, considering how intuitive explanations are necessary for mathematical understanding.

Charles Card and Gary Miller then look at the history of how people have understood the complex numbers in order to shed light on the broader question of how our minds perceive numbers in general. Richard Delaware then recounts the story of two of his students, who showed how a bit of social support can provide a much needed boost to those facing competing demands on their time while pursuing their mathematics education.

Todd Sformo describes experiments in freezing that can best be understood through mathematical models. Quilts inspired by Fibonacci spirals are the subject of work by Kathleen Offenholley, SK Collins, and David Radcliffe. Gladys Krause and Gustavo Velandia wrap up the section with a description of their collaborative lesson that weaves mathematics and music together.

What does it mean to move away from a behaviorist theory of teaching and learning? In the Perspective piece for this issue, Jonathan Clark and Jeneva Clark explore this question using polynomial division as an example.

We also have a book review for you! Mark Huber reviews *How to Expect the Unexpected!* by Kit Yates.

There are two poetry folders in this issue. E. R. Lutken curates for us a fun collection of clerihews from the Bridges conference in 2023. Philip Fried gives us a poetic reflection in terms of a series of almost-sonnets inspired by Abbott’s famous *Flatland*, exploring how the recent COVID-19 pandemic seemed to flatten out our lives and the world around us.
Joseph Chaney, Pamela King, Michael Stanley, Ravindra Bisht, and Heather Cook then round out our poetry section for this July issue.

Our fiction piece for this summer is *Discordium Mathematica - A Symphony in Aleph Minor* by Vijay Fafat, an epic verse that takes readers on an eclectic voyage across exotic lands of mathematical knowledge.

We wrap up the issue with two exciting announcements! The first is an invitation from Frances Rosamond to the Seventh International Conference on Creative Mathematical Sciences Communication, which will happen in October 2024, in Trier, Germany.

Last but not the least, Dioneia Motta Monte-Serrat invites us to a diffusion course on the structure of language as a connection between artificial intelligence, information, and ethics, which will run from August 22 through November 21 of this year and will offer four courses on the topic.

These two announcements remind us that computation has been an integral part of mathematics from time immemorial, and that artificial intelligence is visibly becoming more and more relevant to the world of mathematics as we speak. Given this context, we wanted to share with our readers and prospective contributors our current stance on possible uses of generative AI in JHM submissions.

*The Journal of Humanistic Mathematics* has always sought to explore and emphasize the human face of mathematics; in particular, we hope to underline the humanity of those who learn, teach, and do mathematics. Therefore, we have decided that JHM will not be accepting AI-written pieces, even those intended to test the limits of such tools. We encourage authors to use these tools to create outlines, find references, and polish their grammar, but we will not be publishing works primarily written (or “co-authored”) by AI. We ask that possible future contributors to the *Journal* keep this in mind.

This does not mean that we believe artificial intelligences cannot do mathematics or have interesting things to contribute. On the first question we remain agnostic for now. On the second we have no doubts. In fact even in this issue, we have articles about how computer applications and other artificial intelligence platforms can help us do, teach, and learn math better. All that being said, we know that there is a whole wide world out there for human mathematics. This issue offers you more than six hundred pages of snapshots of this world. We hope you will enjoy the offering!