JMETP
Journal for the Mathematics Education and Teaching Practices, 2(1), 37-39, August 2021
e-ISSN: 2717-8587
dergipark.org.tr/jmetp

Young Wise Publishing
youngwisepub.com

Opinion Article

What I learned from Budapest Semester in Mathematics Education

Mehmet Kirmizi[1]

Department of Mathematics, Texas State University, USA

Article Info

Received: 10 May 2021
Revised: 12 June 2021
Accepted: 17 June 2021
Available online: 15 August 2021

Keywords:
Hungary
Hungarian mathematics education
Productive struggle
Tradition

Abstract

In this paper, I wanted to share my personal experience in Budapest Semester in Mathematics Education as an mathematics educator.

To cite this article

Kirmizi, M. (2021). What I learned from Budapest Semester in Mathematics Education. *Journal for the Mathematics Education and Teaching Practices, 2*(1), 37-39.

Introduction

Hungary is such a powerhouse when it comes to mathematics and mathematics education. Hungarian mathematicians, including Polya and Paul Erdős, have contributed significantly to mathematics and its teaching. They have a long tradition of teaching mathematics, and they are proud of their traditions. The essence of Hungarian tradition is problem-solving, mathematical creativity, and communication. Nurturing mathematical talent is a part of the Hungarian tradition. Studying mathematics is very respectful, and many opportunities are given to mathematicians.

To learn more about Hungarian mathematics education and their mathematical tradition, I attended Budapest Semester in Mathematics Education (BSME) this summer. BSME is a study abroad program in Budapest, Hungary. The goal of the BSME is to make participants experience the general mathematical climate in Hungary and the Hungarian pedagogy. The course that I was attended was called The Discovery Learning: The Posa Method. Lajos Posa is a Hungarian mathematician, and he is well-known for his studies in Combinatorics and mathematics education. Even this course was only two weeks, it was a good learning experience for me. I wanted to share the two lessons that I learned from BSME.

Experiencing the Struggle

My first lesson was, after a while, experiencing the struggle in mathematics. The traditional view of struggles in mathematics is somehow harmful. The current understanding is that struggles are necessary for deep understanding and sense-making in learning mathematics (Hiebert & Grouws, 2007). Learning mathematics is not an easy journey. Instead, it is a challenging experience. The benefit of struggles is that they make you aware of the intellectual need for a solution or an idea. This intellectual need might be aware of a lack of knowledge or creative ways to solve the problem (Kapur, 2008; Warshauer, 2014).

[1] Doctoral Student in Mathematics Education, Texas State University, USA. Email: m_k307@txstate.edu ORCID: 0000-0002-1925-1016

The Posa method is a form of Inquiry Oriented Learning, and the difference is that the IBL is more oriented to general education, where Posa Method is more oriented for gifted Students. According to Posa, learning mathematics is not just about the acquisition of some procedures and rules. It is about sense-making and rediscovering the essential mathematical ideas and problem-solving and the joy of mathematics. However, learning mathematics in this way is a challenging task. In the course, we worked on few cognitively challenging problems for each class. Each problem is unique, and the instructor did not expect you to solve problems at that moment. As a learner, you need to think of some creative ways to solve these problems. If we had a correct solution, we could confer the solution. However, if you did not have a correct solution, the instructor did not help us. May be some question to redirect our thinking, that is it. This forces you to think; I struggled a lot. That is the joy of mathematics. The joy is that you know there is a challenging problem, and there are a group of smart people you wanted to be the first one to solve. It is like solving a puzzle. At the end of each lesson, whenever somebody explained the solution, I made sense of it.

This experience made me think about my teaching. As a teacher, I used to believe that a teacher's job is to make students comfortable with the material, and I was helping my students a lot when they had struggles. However, this BSME made me experience the benefits of challenge from the firsthand. I believe BSME will positively influence my teaching.

Society and Tradition

My second lesson is the importance of society and tradition. Since the beginning of history, learning has usually been described as acquiring knowledge. In this acquisition-based learning, teachers are the source of the knowledge, and students are usually the passive receiver of the knowledge. The acquisition is an umbrella term, and many learning theories are fallen under this category (Sfard, 1998). However, learning is not just an accumulation of knowledge. Learning is a social event, and knowledge is inseparable from the context being developed. Learning is a participation of a particular community of practice (Lave & Wenger, 1991).

George Polya (1887-1987) is one of the most famous mathematicians, and his famous book is How to Solve It?

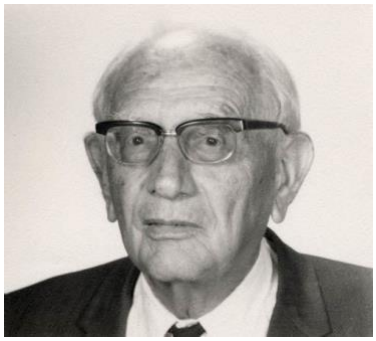

Figure 1.

George Polya (1887-1987) was One of the Most Famous Mathematicians

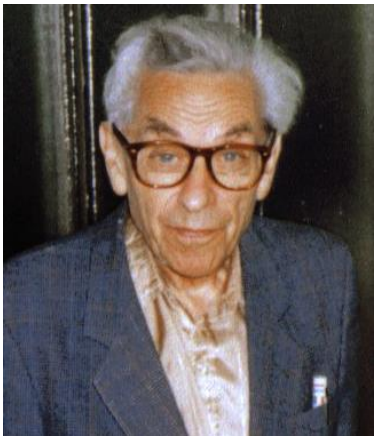

Figure 2.

Paul Erdos (1913-1996) was One of the Most Productive Mathematicians at

In Hungarian tradition, mathematics is considered a dynamic body of continuously evolving and growing knowledge. The teaching of mathematics should reflect the constant reconstruction side of science. They emphasized the importance of intuition and gaining experience in mathematics. In Hungarian pedagogy, teachers make students experience various problems to help them to rediscover the essential mathematical ideas. In this rediscovery process,

problem-solving and creativity play an essential role. Hungarian mathematicians believe that playfulness is inseparable from learning mathematics. Mathematics can be considered a form of art. Since Hungarian understanding of mathematics is formed around intuition, creativity, and playfulness, they tend to use less formal language and new notations (Gosztonyi, 2016). Being a mathematician is a highly respected career in Hungary. The instructor, Peter Juhasz, also took some classes from Posa himself when he was a teenager, and he told many times how his participation in Posa's lessons influenced him to be a mathematician.

The lesson is that individuals do not grow in isolation; regardless of talent, individuals need tradition and a supportive environment to grow. Recently, some countries, like Turkey, invest heavily in gifted education, hoping that this "gifted" induvial will become a world class scientist and mathematicians and then contribute to society. However, this naïve belief is missing in one essential piece in the equation: society and opportunities. Many people study mathematics, not just its internal beauty; it gives people opportunities (Apple, 1992). There is a reason why it is called the queen of science. Once one has a certain level of mathematical understanding, one can seek a career in almost every field. Unfortunately, in many countries, studying mathematics at college or higher is neither respectful nor gives opportunities. Mathematics is merely a tool to go medicine schools. If those countries, including Turkey, want the recent efforts and investments in gifted education is to be successful, they should discuss the importance of society and opportunities.

In this paper, I wanted to share what I have learned from the BSME. The first lesson was to experience the cognitive benefits of struggles firsthand. The second lesson is the importance of society and tradition in learning.

Acknowledgment

I thank my advisor Assoc. Prof. Dr. Sharon Strickland for informing me about BSME.

Biodata of the Authors

Mehmet Kirmizi is a 3rd year Ph.D students in mathematic education at Texas State University. Prior to his Ph.D career, he taught mathematics for a long time in Turkey.

References

Apple, M. W. (1992). Do the standards go far enough? Power, policy, and practice in mathematics education. *Journal for Research in Mathematics Education*, 412-431.

Gosztonyi, K. (2016). *Mathematical Culture and Mathematics Education in Hungary in the XXth Century*, Cham.

Hiebert, J., & Grouws, D. A. (2007). The effects of classroom mathematics teaching on students' learning. *Second handbook of research on mathematics teaching and learning, 1*, 371-404.

Kapur, M. (2008). Productive failure. *Cognition and Instruction, 26*(3), 379-424.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*: Cambridge university press.

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher, 27*(2), 4-13.

Warshauer, H. K. (2014). Productive struggle in middle school mathematics classrooms. *Journal of Mathematics Teacher Education, 18*(4), 375-400. doi:10.1007/s10857-014-9286-3