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THE UNFORGETTABLE EXPERIENCE OF A WORKSHOP ON PYTHAGORAS THEOREM



Salima Shahzad Arwani runs a workshop with colleagues in which awareness of Pythagoras' theorem was raised.

Introduction

$a^2 + b^2 = c^2$, this expression still remains in my mind and looking at this expression I can easily recall the days of studying in secondary school. If we look at the history, it shows that this expression had been known to the Babylonians and possibly to the Chinese, a thousand years before the Greek philosopher 'Pythagoras' (Maor, 2007). Moreover, Pythagoras' theorem has many more applications in our daily lives. Realising the importance of the theorem in terms of area it was decided by my colleagues and I to explore it, and to conduct a workshop to raise awareness for other teachers, so that they can teach their students beyond the textbook exercises and be able to extend the usual definition of Pythagoras theorem. This workshop was an unforgettable event in my life because it was the first time that I had conducted a workshop for teachers. This article describes an unforgettable personal learning experience and the insight gained during that workshop.

Previous experience and pedagogical content knowledge

I had never taught Pythagoras theorem before because I teach in primary schools. However, my teachers taught me in a traditional way by using the chalk and talk method. Because of that I had always wondered how I might learn Pythagoras theorem more effectively? How might I relate the theorems to my daily life? So for this reason I would say that

I was very fortunate to be given the opportunity to become involved with in-depth learning in order to enhance my pedagogical content knowledge as well as the chance to enhance other teachers' conceptual and pedagogical understanding about Pythagoras theorem. Furthermore, after the workshop was completed, I developed a model in which I can see my learning in organising, planning and conducting workshops. To see the model go to page 36.

Planning phase

For this workshop I worked with three of my class fellows and worked collaboratively to achieve an in-depth understanding of the concepts in addition to planning and conducting the workshop for teachers. As a primary teacher it was difficult for me to lead the workshop because I lacked confidence in my conceptual understanding of the topic. However, I found that my group members were supportive and helped me build a relationship in which we worked collaboratively. During the planning phase we accepted each other's ideas in order to achieve our common goal.

Pythagoras theorem as geometric statement about areas

With the entire group working together we felt ready, and able, to conduct the workshop. During the first activity, we asked participants about their understanding of Pythagoras theorem. The responses

were: “the sum of the squares of the lengths of two sides of a right triangle is equal to the square of the length of the longer side (hypotenuse)”.

This was expected because as mathematics teachers we usually teach Pythagoras theorem by giving two side lengths so that the length of the third side can be calculated using the formula. However, the concept plays an important role in the understanding of area. In fact, according to Pythagoras the theorem was viewed as a geometric statement about areas.

At that time I was of the opinion that no one had related Pythagoras theorem to area. Therefore, I thought it would be a learning point for participants if they could explore Pythagoras theorem as an area concept, and when they returned to their schools it would be beneficial for students as they would be able to see applications in daily life, such as finding the diagonal of a baseball ground, TV screen and so on. The intention was that each of the teachers would learn and apply their understanding so as to bring changes to their mathematics teaching and foster students’ learning, which was the ultimate reason for the workshop. For me, this workshop paved the way to conducting future events.

On the spot decision making

During the second activity a challenge was faced when participants were asked to prove the theorem by using three squares of different sizes. All the participants made the combination of 3×3 , 4×4

and 5×5 and their understanding was that they could not do this with any other combination. Although the participants enjoyed demonstrating Pythagoras theorem by doing hands-on activities, they were unaware of the Pythagorean triples and it was very important to explain to them about other combinations, for example (5, 12, 13). Unfortunately because of a shortage of time, it was difficult to allow sufficient time for the participants to explore the triples effectively. However, it made me realise that the reason why students were focusing on one set of triples was because of their limited knowledge of Pythagorean triples. Course members were encouraged to go and find out more about the triples. We had not planned for Pythagorean triples but looking at the situation, as the workshop unfolded, the decision was made to explain the triples to participants. It would have been better if we had planned additional activities to overcome this lack of subject knowledge.

Conclusion

In short, it was an unforgettable event because it was the first time that I had interacted with teachers from a different school system and I developed presentation skills and confidence in my own abilities.

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What I learnt by conducting the workshop

