

Exploring How Culture of Excellence is Personified by Mathematics Teachers in the Public Schools

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ARTICLE INFO

Received: 06 October 2021

Accepted: 22 November 2021

Published: 02 December 2021

DOI: 10.32996/ijahs.2021.1.1.13

KEYWORDS

Culture of excellence, mathematics teachers, scholar graduates, public schools, quality education

ABSTRACT

This basic qualitative study aimed to describe how the culture of excellence is being personified by mathematics teachers who were scholar graduates of a certain state university in the Western Visayas region in the Philippines. Eight public school mathematics teachers were included in the study purposively. The researcher utilized semi-structured interviews in gathering the data. Thematic analysis was used to analyze the qualitative data. Findings revealed that mathematics teachers personified the culture of excellence in mathematics education by integrating different strategies in teaching mathematics, being passionate and dedicated, and by pursuing continuous professional growth. In addition, they have manifested excellence in mathematics education through the following: conducted action researches in mathematics education, attended various seminars and training, actively involved in different committees and organizations in and out of school, and received recognition as winners and coaches in different math-related and non-math related activities.

1. Introduction

As a major component of quality education, the excellent performance of teachers is widely recognized as a critical factor influencing education quality. They are the lifeblood of any education system. They are on the front line in discharging educational objectives. According to Nadeem et al. (2011), in all education systems, the performance of teachers is one of the handful factors determining school effectiveness and learning outcome. Poor performance and low enrolment are some of the inferences regarding the performance of teachers. Moreover, Tehseen and Hadi (2015) noted that poor performance of teachers leads to poor quality of students. They also asserted that poor teacher performance leads to several problems experienced in school, like a low performance of the student, delay in the delivery of education, among others. Hence, the culture of excellence in how they perform their functions in the education system has to be sustained to ensure relevant and quality education. To produce excellent education, schools with science and mathematics curricula must have teachers who are equipped and well-trained to execute teaching using a variety of instructional strategies (Padul, 2010).

Furthermore, studies and other related literature advanced different indicators or measures of the culture of excellence and quality education in the field of mathematics considering the significant role of teachers. According to McGraner et al. (2011), the teacher's mastery is necessary for effective teaching to take place. The logic herein is that teachers who possess strong mathematical knowledge at great levels of depth and span are more likely to foster a student's ability to review, conjecture, and solve problems.

Lapuz (2010) further emphasized that to be an effective teacher, one should understand the content that they teach and know how to explain that content in a manner that their students understand. Likewise, Goe (2007) found out that teachers who held a master's degree and had undertaken more coursework during their education seem to be positively related to their students' mathematics achievement. In addition, Achola (2012) said a better educated or trained teacher produces positive learning outcomes, and for this to be realized, a teacher needs to be provided with room for development. Another key reason for teachers

to engage in continuous professional growth is that it can be hugely important in helping support major educational reforms or changes within the education sector (Starkey, et al. 2009). In terms of excellence in quality mathematics instruction, Hudson et al. (2010) also conducted a study wherein teachers used PowerPoints, web-based games, the internet, projectors, smart boards, calculators, videos, and music to enhance their mathematics instruction. The result of the study revealed that technology improves achievement, enabling learners to be independent problem-solvers, competent and creative thinkers, as well as effective communicators. To add, Nabayra (2020) found out that students appreciate the concepts of mathematics in nature when teachers hybridized these topics with videos, as revealed by their learning experiences. This is one way of showing exemplary mathematics instruction integrating technology-enhanced resources in teaching the subject.

In view of the means of how a culture of excellence could be exemplified by mathematics teachers in the field of education as cited by various studies in different contexts, this study would further extend the horizon of how this culture of excellence is being personified by mathematics teachers in the public schools, who are scholars in their college years, reflecting on their experiences and views.

2. Methodology

This study employed the basic qualitative study of Ary et al. (2010). Basic qualitative studies, also called basic interpretative studies by some, provide rich descriptive accounts targeted to understanding a phenomenon, a process, or a particular point of view from the perspective of those involved. The central purpose of these studies is to understand the world or the experience of another. With roots in the social sciences, these basic studies may use a variety of techniques for collecting data, with analysis focused on identifying recurrent themes or patterns. Basic interpretive studies are more simplistic compared to other qualitative approaches (Ary et al., 2010). Hence, this design suits this study since the goal was to describe how the culture of excellence is personified by mathematics teachers in public schools.

2.1 Participants of the Study

This study purposively included eight mathematics teachers from eight different public schools in the Province of Aklan, Philippines. They are scholar graduates of a certain State University in the Western Visayas region, hence suited to the inclusion criteria on the culture of excellence. Furthermore, these mathematics teachers spent at least four years in service to the public schools after graduation. All of them were currently employed in the Department of Education (DepEd).

2.2 Data Gathering Method, Procedure, and Analysis

For the purpose of this study, the researcher utilized a semi-structured interview guide as the main data gathering instrument. This research instrument was subjected to content validation by different experts. The process of gathering pertinent data in this study followed the procedure below.

The researcher asked permission from the participants to conduct an interview about how they personify the culture of excellence in mathematics education. In the first part of the interview, mathematics teachers were asked about their views on how to personify a culture of excellence in mathematics education, then on the second part, they were asked about how they personify culture of excellence in terms of research, professional development and positions held, and honors, awards, and recognitions received. During the conduct of the interview, they were allowed to speak in their mother tongue so they could express their thoughts better. The interview was conducted privately with the respondents after they had set the time with the researcher. The researcher assigned different code names for each mathematics teacher to maintain the confidentiality of data and ensure anonymity. Thematic analysis was used to analyze qualitative data.

3. Results and Discussion

3.1 Views about Personifying Culture of Excellence in Mathematics Education

In the first part of the interview, mathematics teachers were asked about how they would describe a teacher who personifies the culture of excellence in mathematics education. Based on their responses, a teacher must be integrating different strategies in teaching math, being passionate, dedicated, and motivating teachers, and in pursuit of continuous professional growth.

Integrating Different Strategies in Teaching Mathematics. Integrating different strategies in teaching mathematics is evident in the responses of the participants to the interview question. Participants believed that to personify a culture of excellence, a teacher must find many ways and avenues in order to deliver their lesson effectively to the student. This was shown based on the answer of Ma'am Rachelle:

"A teacher personifies culture of excellence in mathematics education if he/she is someone who is researching and experimenting different strategies that suit the interest and level of the learners."

Another teacher shared the same thought — that she finds another way for the students to love mathematics even if it is a difficult subject. She integrated another strategy in making her class fun and exciting. Ma'am Trixie said:

"Syempre, sa akin kasi yong math yong mga bata takot dito, so I'm trying na dapat they will love mathematics, kahit hindi, basta as long na hindi sila nahihirapan. Kung baga, inaalís ko ang pagiging strict and much more on parang naglalaro lang sila kasi ini-integrate ko ang mathlympics, yong mga games during our class. (Students generally fear mathematics, so I strive to make them love the subject. Even if they don't love it, they don't have to struggle. I try to make the subject less strict and make it appear like they're just playing as I integrate mathlympics and various games during our class.)"

These findings support Mulligan (2011), who said that to become effective, teachers need to learn, adapt and use teaching strategies in their day-to-day lessons in the classroom. He further pointed out that effective teaching requires "flexibility and creativity, constant monitor and adjustment" of the teaching techniques. On the other hand, Moore (2012) cited that to stay aligned with the educational standards, our teachers must be able to teach mathematics using various techniques and alternative strategies to reach our learners. This differs from the predominant traditional method of teaching mathematics, which usually consists of memorization, practical use of numbers and equations, and is usually teacher-centered.

Being Passionate and Dedicated Teacher. The findings of the study revealed that a teacher who personifies a culture of excellence in mathematics education is passionate and dedicated. Participants shared the same sentiments that an excellent teacher has a passion for teaching and works beyond what is expected of them for the students to learn mathematics. Sir John explained:

"A teacher who demonstrates a culture of excellence in mathematics teaching is the one who teaches for understanding and not simply for the sake of just doing the job for practical purposes. They do their best to motivate the students to learn and appreciate this difficult subject, and to do this they always teach with utmost enthusiasm."

Similarly, Sir Renz said that a teacher shows excellence in teaching mathematics if he/she can teach effectively with or without the supervision of his/her department head or principal. In addition, he explained:

"He/she shows passionate love and shares the culture of excellence in mathematics with his/her students through encouraging and motivating them to participate in mathematics-related activities."

These results confirm the claim of Ladd (2006) that the single most important quality that every teacher should possess to make education work is love and passion for teaching young people. This could not be replaced by anything. The best teachers go out of their way to find ways to relate to each of their students. Moreover, Mart (2013) explained that passionate teachers are distinguished by their commitment to achieving for their students and that passion was an essential part of successful teaching. Passionate teachers cultivated the students' curiosity and interests while showing commitment to their learning.

Pursuing Continuous Professional Growth. The mathematics teachers revealed that pursuing continuous professional growth is one way of personifying a culture of excellence in mathematics education. They believed that teaching is never-ending learning that is why they need to level up their professional career by attending seminars and pursuing graduate studies. One teacher said:

"A teacher who personifies a culture of excellence is a mathematics teacher who continuously grows professionally through pursuing graduate studies, attending seminar-workshop on mathematics and conducting research that aims to improve the quality of mathematics education in our country."

This was further emphasized by Ma'am Rachelle:

"A teacher who is never tired of learning despite the problem and obstacles he/she may encounter. A teacher who is learning beyond the payable time and never thinks he/she is overworked."

Lastly, Sir John stated:

"A teacher who maintains a high standard of teaching that results in useful learning is also personifying excellence."

This conforms to the study of Harnett (2012), which explains that through efficient professional development, teachers will learn new skills, become more effective, learn off other people's experiences and develop a clearer teaching philosophy that suits their style. This will help create more confident teachers who are less afraid to take risks, which can only benefit both teachers and students in the long term.

3.2 Personifying Culture of Excellence in Terms of Research

In terms of research, the participants were asked if they have conducted researches during their teaching career and what were the impacts of these researches in mathematics education. They revealed that they were involved in action researches during their college and graduate degrees. Moreover, they conducted action researches as a requirement in their school. It is noteworthy that these action researches help them in their teaching practices.

Action Researches. Mathematics teachers shared a common answer that the only research they have conducted is action research. Most of these action researches are requirements during their undergraduate and graduate degrees. One teacher shared that she made action research as a requirement in their master's degree. Ma'am Sheila stated:

"I have done action research as a requirement during our master's degree at the University of St. La Salle Bacolod. It is titled "Difficulty of Students in Word Problems." This action research that I conducted really helped me to enhance my teaching strategies and use all the possible resources in the locality."

On the other hand, Sir John shared:

"During college, we were required to do research work, specifically action research testing the effectiveness of tutorial to improve mathematics learning among students. This action research demanded we devise a tutorial plan to be administered twice a week for a period of one month to low-performing students. Tutorial, as an intervention, was proven effective in improving outcomes. The methods and strategies were introduced also to required remedial classes comprising low-performing students when I taught in the 9th grade for three years."

Unfortunately, the findings of the study revealed that among these action researches, none of them were presented in fora and conferences or even published in journals. In addition, one of the scholars revealed that he was not involved in any research study in his teaching career. But Sir John reported:

"Currently, I am working on research, developmental in nature, about practical usage of smartphones in the classroom setting. As for the use of mobile devices in mathematics class, though the study was still in development, I personally have instances when I taught with these devices as supplementary learning materials. Example cases are the use of Geogebra and Owexbook, computing software and a module type learning app."

The statements above support the study of Johnson (2012), which asserts that action research bridges the gap between research and practice. For instance, the theoretical components underpinning action research practice are used to help practitioners understand and observe what is happening in a classroom setting. At the same time, and with the interests of best practice in mind, these collected data "are used to understand or inform theories and research related to best practice."

3.3 Personifying Culture of Excellence in Terms of Professional Development and Positions Held

The participants were asked about their professional development and position held since they started teaching that made them excellent in mathematics education. The study revealed that mathematics teachers were pursuing a graduate degree, attending various seminars and training, and had active involvement in different committees and organizations.

Pursuing Graduate Degree. Pursuing a graduate degree was seen as one of the ways of the teachers in portray excellence in mathematics education. They confirmed that all of them were pursuing a master's degree major in mathematics. Two of them already graduated with their degree, four were on their thesis writing and two were still on their academic track. The findings of the study show that these teachers have never stopped in their pursuit of professional development. Ma'am Cathy said:

"I am currently finishing my postgrad education at Filamer Christian University for Math and the University of Southeastern Philippines for Special Education."

Similarly, Scholar Ma'am Rachelle shared:

"Aside from attending the yearly in-service training for teachers, I am also taking my master's degree in mathematics and I am now in my thesis writing."

Findings confirmed the result of the study of Harris and Sass (2011) that there was a positive relationship between teachers who had obtained an advanced degree during their teaching career and their students' achievement in middle school mathematics.

Attending Various Seminars and Training. Another way to upgrade their professional career is to attend different seminars and training related to mathematics education. Math teachers also elaborated how they articulated their learnings from these seminars and training in their mathematics classroom and other school-related activities. Sharing his experiences, Sir Renz recalled:

"In my three years in teaching, I attended three seminars/training related in mathematics namely: (1) Recalibrating Mathematics Education through Mathlympics, Mathematics Modelling and Alternative Strategy for Effective Teaching: Information Processing, (2) Regional Training on Teachers: Pedagogical Retooling for Mathematics, Languages, and Science for Grade 7-10, and (3) Regional Training on Teachers: Critical Contents on Mathematics 8. In terms of the impact of these seminars in my classroom, I tried to recalibrate mathematics education by integrating Mathlympics in the teaching-learning process. I incorporate games inside the classroom. It definitely makes learning effective. I also use retooling in Mathematics. I used the worksheet, apply the strategies and devise new instructional materials to improve my teaching and enhance learning."

Another participant shared the same experience. He found these seminars and training very useful in his classroom in terms of new strategies and techniques in improving his teaching practices. He emphasized:

"I have been active in professional development pursuits during my career as a teacher. I have attended four international seminars on mathematics education and several national seminars as well, most frequently, under the topics: teaching pedagogies, K-12 curriculum, research and development, and new trends in education. I apply new knowledge or updates I learn from these professional development endeavors to the classroom setting in different ways. Examples are new ways of solving a problem, better ways of explaining a particular concept, effective teaching strategies, and techniques that make learning stick. Also, I introduce new forms of technologies to aid learning like mobile apps and use of tablet computers."

These findings attest to the claim Gelleto (2017) that a number of seminars/training of Mathematics teachers caused the variation in their students' performance in the 2017 Metrobank-MTAP-DepEd Mathematics Challenge, where the performance of students who were taught by teachers with a higher number of seminars/training in Mathematics attended was higher than their counterpart. It can be deduced that the number of seminars/training of Mathematics teachers attended categorizes higher students' performance. It can be concluded that the training of teachers influences their ability to characterize the students' achievement.

Active Involvement in Different Committees and Organizations. It was disclosed based on the results that these teachers are very active in terms of activities in their respective schools. Most of them had major contributions, from holding different committees and organizational positions assigned to them. It is interesting that they also shared their contributions, which created an impact in mathematics and other subjects. In terms of positions related to mathematics, Sir Rolly asserted:

"I am the adviser of the mathematics club in our school and a member of the Mathematics Teachers Group in the province of Aklan. Holding these positions, I somehow change the perspective of some students that mathematics is difficult."

Similarly, Sir Renz shared:

"I've been an active member of the committee holding mathematics-related contests, like the Division Mathlympics for students and the Metrobank-MTAP-DepEd Math Challenge Division Oral Competition, and I've been the quizmaster for three years."

Furthermore, the findings of the study showed that math teachers held other positions not related to mathematics, like ICT (information and communications technology). As a matter of fact, three of the graduate scholars were ICT coordinators in their schools. Sir Andrew said:

"I was designated as school ICT coordinator last 2016. Recently, in our district, I was designated as District SBM (School-Based Management) Coordinator for high schools. Holding these positions, I became part of technical-working groups and I can now provide assistance in every school."

3.4 Personifying Culture of Excellence in Terms of Honors, Awards and Recognitions Received. In terms of honors, awards, and recognitions received, math teachers shared limited thoughts about this. They shared a common answer that most of the awards received were being a winner and coach of their students in different

contests especially in the yearly Math Challenge Competition and Mathlympics. Other than that, some of them won in competitions Mathlympics for teachers. They received different recognitions as coaches in different activities of their students. They believe that the achievements of their students reflect their excellence in coaching. They also shared how these awards and recognitions inspired them to improve their teaching performance. Sir John said:

"Last school year 2015-2016, we won the division level MTAP competition for Grade 10 where I was the coach of the team that bagged 1st place. It was really an honor for our school to represent the whole division for the regional level of the math competition. I helped make the school much more noticed. Also, I am grateful that they recognized my expertise in the subject, and I realized that I was doing the right thing, and this kept me moving forward."

Furthermore, Sir Renz and Sir Andrew recalled that they won in Mathlympics for teachers. They shared a common answer:

"I received a Certificate of Merit as champion in Kakuro during the Division Mathematics Tournament for Teachers (Mathlympics)."

On the other hand, one teacher also received recognition as a coach in another field: sports. Ma'am Rachele said:

"We won several awards in sports, like recognition as coach in chess and Pencak silat up to provincial level. I also received recognition as a technical official in sports, and I'm a Class 11 National Wasit/Jury for Pencak silat. These awards are not really related to mathematics but I used what I've learned and integrated them into my lessons, specifically for motivation purposes. I'm telling my students that sports is one way to sharpen the mind and this helps students to think critically, which is important in learning mathematics."

These results confirm the study of Ocampo (2014), which indicated that mathematics competitions increase motivation, excitement, and interest; provide schools and parents with information about abler students; and are a potent tool in improving the teachers' professional competencies. In addition, Grassl and Mingus, as cited by Bicknell (2008), asserted that mathematics competitions are a means for providing an encouraging environment in which gifted students compete, excel, and are honored for their abilities.

4. Conclusion

Mathematics teachers in the public schools indeed embodied excellence in different aspects of their teaching careers personally and professionally, as reflected on their achievements in personifying a culture of excellence to uplift the standard of mathematics education in the country. Since they personify a culture of excellence in terms of action researches, the scholar graduates should continue doing action research because this does not only exhibit a culture of excellence but is also a way for them to solve, if not minimize, the problems they encounter in their classrooms. Moreover, since education is a never-ending process, their professional growth through pursuing graduate studies and attending relevant seminars and training should continue. Through continuing education, scholar graduates can constantly improve skills and become more proficient in their jobs. This can also transform them into better educators who are able to create relevant and tailored instruction for today's students. Additionally, it could be a way for them to push their boundaries and actively create challenges for themselves to reach more excellent accomplishments in the field of mathematics.

Furthermore, their contributions to their respective schools by actively participating in different committees and initiating various activities, as well as their achievements in many contests, show how far they can go to achieve excellence and uplift the name of their school. These exemplary mathematics teachers who are scholars in their college years proved that they don't just aim for recognition of themselves but of their school as well — a manifestation of their passion and dedication for the teaching career.

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