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Looking Through Different Points of Views: Characteristics of a Good Mathematics Teacher

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Mathematics is essentially used in many fields. Due to its importance, nurturing mathematical knowledge in students is deemed crucial in education now. Providing a good mathematics teacher is an important factor in developing students' mathematical skills and knowledge. This study aims to explore the characteristics of a good mathematics teacher from the points of view of teachers and students. In order to investigate the characteristics, this study employed a qualitative method using semi-structured interviews and focus group sessions involving twenty-three informants consisting of mathematics teachers and students. The informants were purposively selected from several schools in the southern region of Malaysia. Once the data were collected, they were qualitatively analysed using thematic analysis. Based on the findings, there are two main perspectives on the characteristics of a good mathematics teacher based on the teacher's and student's perspectives. Teachers define the characteristic of a good mathematics teacher from the aspects of the teacher's knowledge and experience. In comparison, students viewed it from the aspects of teachers' personalities, teaching styles, and delivery instructions. So, in conclusion, mathematics teachers and students have different points of view when describing the characteristics of a good mathematics teacher.

Keywords: characteristics; mathematics; qualitative analysis

I. INTRODUCTION

The past few years have witnessed an almost exponential growth in the area of mathematical education and research (Cobb, 1986). In 2016, The Star Online reported that despite the increasing importance of mathematics today, Malaysia scored 446 in Mathematics, 431 in Reading, and 443 in Science based on the Organisation for Economic Cooperation and Development (OECD) under the Program for International Student Assessment (PISA) 2015. Although this result was an improvement from the result obtained in 2012, where the scores were 421, 398, and 420, respectively, it is still underachievement. Despite the progress, Malaysia is still ranked below the global average rating, which is 490 in Mathematics and 493 for both Reading and Science (Menon, 2016).

In the effort to nurture mathematics in today's generation, attention is also focused on the effectiveness of knowledge transmission apart from the ability and capability of students in grasping the knowledge. Zakaria and Iksan (2007) also added that effective mathematics dissemination ensures the success of mathematics experts' in the future. The notion of the characteristics of a good mathematics teacher is an elusive concept that has permeated the literature for decades (Wilson, Cooney & Stinson, 2005). The goal of mathematics education is to generate pupils who are good at the subject undoubtedly, but only a few turn out to be successful in mathematics. There is an even higher number of students who find mathematics difficult (Tall &

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Razali, 1993). Today, as in the past, many students struggle to cope with mathematics and become discontented as they continually fail to master the subject.

Therefore, educators and academic practitioners need to study and master effective methods of disseminating knowledge to able good and weak students to allow both groups of students to excel in mathematics (Walshaw, Margaret & Anthony, 2009). Although teachers' characteristics that affect students' learning process have become important (Torrance, 1966), there is still no clear agreement on the arguments (Stronge, 2007). Recent studies have explored the concept of quality and effective mathematics teaching, but very few have considered students' perspectives regarding this matter (Murray, 2011; Hapsari *et al.,* 2017). The misunderstanding in mutual views on these topics between teachers and students may harm the efficacy and efficiency of teaching and learning (Bullock, 2015). Factors contributing to a good mathematics teacher may vary between teachers and students according to their educational background (Sibel Yesildere-Imre, 2016), philosophical underpinnings of the research (Wilson *et al.,* 2005a), experience, and their expectations from one another. Further comparative research from other perspectives could provide valuable insights into describing effective mathematics teaching within the community of the mathematics education environment.

On the other hand, this insight also enables us to better understand students' classroom life preferences, their takes, and thoughts on ways to enhance their learning (Murray, 2011). Apart from educational philosophers, educational researchers also pine over the mysteries regarding good teachers and good teaching (Murphy, Delli & Edwards, 2004). Most scholars agree that teachers make a substantive difference in students' academic achievement (Canales & Maldonado, 2018).

Generally, effective teachers are described to possess business-like in teaching, clear and specific in the use of language, and adept in the use of paralanguage (Onwuegbuzie & Withcer, 1999). According to Sibel (2016), a good mathematics teacher should possess three main skills: impeccable mathematics content knowledge, pedagogy skills, and handling human relationships. These skills could help teachers explain and deliver mathematical concepts effectively according to the recipients' acceptance level (Sibel Yesildere-Imre, 2016). In addition, the author also added that the skills could also help the teacher handle, motivate, and engage the students' interest in mathematics.

II. LITERATURE REVIEW

A good teacher is defined as a "high-quality teacher" who is highly qualified with proper educational background, certificate, and passing scores on qualification tests (Martinez-Sierra, 2014). On the other hand, the school system defined good teachers by linking the concepts to excellent teaching, identifying based on the teacher's behavior, and connecting with successful students' outcomes and test scores (Cochran-Smith & Fries, 2001). Ideologically, a good teacher is more significant than an educator. All the characteristics that make a teacher good are rather complex and comprehensive (Bullock, 2015). Trying to put together all the essential qualities of a good teacher is not easy (Korthagen, 2013).

This theory of ideal ways for teachers to behave is not an existing idea. Educational researchers have already initiated many characteristics that explain a "good teacher." In some research, the good teacher is also known as an "ideal teacher" (Naciye, 1998). It is essential to define a good teacher's general characteristics because the definitions later can be used to generate general prototype characteristics of a teacher that can then be used to adapt to all teachers and to which later teacher can mentor and aspire (Bullock, 2015). In defining a solid symbol of a good teacher, many pieces of research have been done. In the present time, many attempts have been made to explain these characteristics through listings of competencies – it is a rigid point that is firmly stanchioned by policymakers (Becker, Kennedy & Hundersmarck, 2003).

Nevertheless, many dilemmas have been raised throughout the year. These doubts are mostly circulated about the validity, reliability, and practicality of those lists. Researchers have been questioning whether it is possible to explain good teachers' characteristics in terms of only the teacher's competencies (Korthagen, 2013).

Mia Bullock suggests looking at a good teacher's characteristics from every perspective of a person's character building, including personalities, behaviors,

abilities, and social-relational skills (Bullock, 2015). With the specific roles of teachers, these factors should be related to the teachers' essence to describe the characteristics. What kind of particular personalities are required to make a good teacher, and what behaviours should good teacher displays. The teacher's teaching abilities should also be taken into account, and how a good teacher displays a good teacher-students relation to show that the teacher possesses interpersonal skills. According to the pedagogies' requirement changes, students' needs and expectations have continuously changed throughout the decades. Since the radical shift in pedagogical engagement, such as student-centered inquiry and problem-solving, had been widely advocated by educators (Haider & Jalal, 2018), teacher's roles also have been evolved; from the traditional position to that of a coach in students learning process (Blackie, Case & Jawitz, 2010).

Students' ideas should be heard, listened to, and considered because they are the ones who undergo the classroom experience with their respective teachers, and they are the ones who are directly affected by good and bad teaching. Students in action in the teaching and learning environment know better about what will suit their learning preferences to make the process much more effective (Follman, 1995). Understanding how students learn will help teachers find the best-suited way to teach a subject (Abdurrahman, Abdullah & Osman, 2020). Murray (2011) has investigated the students' views on 'good mathematics' teachers (Murray, 2011a). Another similar research reported by Kaur (2009) investigated students' descriptions of the qualities of 'good mathematics lessons' and 'the best mathematics teachers' (Kaur, 2009).

Teachers' perceptions are also essential because they provide insights into a good teacher's identity (Beijaard, Verloop & Vermunt, 2000). Wilson, Cooney, and Stinson's (2005) research contradicts Murray's study from the focus point of view, while Murray considers the characteristics of good mathematics teachers from a student's point of view. At the same time, Wilson, Cooney, and Stinson looked upon this issue from teachers' perspectives, where they have conducted a study examining a total of nine experienced and professional teachers to know what are their views of good mathematics teaching and its development (Wilson *et al.,* 2005a).

Misconception about the bilateral views of teachers and students may bring impairment to the efficiency and efficacy of the teaching and learning process (Beishuizen, Amsterdam, Putten, Bouwmeester & Asscher, 2001).

According to Anthony and Walshaw (2009), ten prime concepts of an efficient mathematics pedagogy should not be neglected (refer to Figure 1). But to be clarified as part of a complex web of aspects affecting students' learning process. These concepts include elements of methods related to the classroom community, a discourse, tasks that enhance students' thinking, and the important role of the teacher's knowledge.

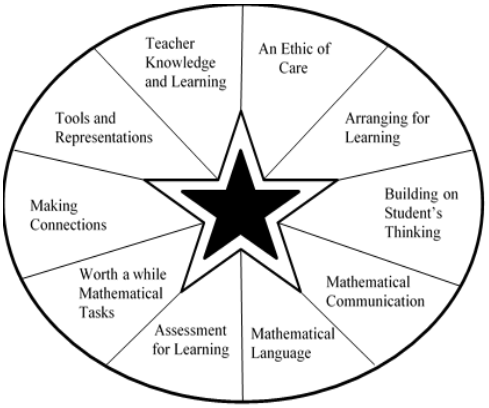

Figure 1. Principles of Effective Mathematics Pedagogy (Anthony & Walshaw, 2014)

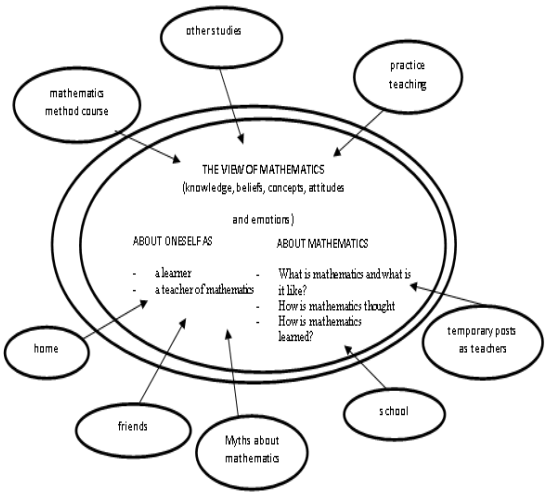

Figure 2. The model for the formation of the prospective teacher's view of mathematics teaching (Pietilä, 2003)

Another research by Pitetila (2002) mentioned that a good mathematics teacher needs qualities connected to their view of mathematics. This mentioned view consists of the teacher's knowledge, belief, conception, attitude, and emotion. It can also be divided into two major components: the view of oneself as a learner and mathematics teacher and the aspect of mathematics and its teaching and learning (refer to Figure 2) (Pietilä, 2003).

To support the listed characteristics, Bullock (2015) stated that a good teacher should possess the characteristics related to the teacher's personalities, behaviours, abilities, and relational skills and are often extensive and complex (Bullock, 2015). Bolyard and Moyer – Packenham (2008) have identified six characteristics that are often studied as the indicators of an individual teacher's standard, the general ability, experiences, pedagogical knowledge, subject knowledge, the status of certification, and teachers' behaviour practice and belief (Bolyard & Moyer-Packenham, 2008). There are also other beliefs on the characteristics of a good mathematics teacher. For example, according to Onwuegbuzie & Withcer (1999), a good mathematics teacher is he, who manages his lesson arrangements accordingly with a schedule that includes a detailed explanation and examples, provides immediate and corrective vibe feedback and ensures plenty of repeated practice time (Onwuegbuzie & Withcer, 1999).

III. MATERIALS AND METHOD

A. Objectives

This study explores teachers' and students' perspectives on the characteristics of a good mathematics teacher. Based on the literature review, various studies have been conducted on the characteristics of good teachers from teachers' (Bayar, 2014) or students' (Martinez-Sierra, 2014; Ifeanyi, 2016) perspectives. Only a few studies specifically study the characteristics of good mathematics teachers and compare both parties' perspectives to find the overlapping characteristics. So, in this study, we focus specifically on teachers that teach mathematics subjects and take into account both mathematics teachers' and students' perspectives and find the common agreement in both.

- To explore the characteristics of a good mathematics teacher from the teachers' point of view.
- To explore the characteristics of a good mathematics teacher from the students' point of view.

B. Samples

A purposive sampling technique was used to select the participants. Purposive sampling is a not random technique that does not need any base theory or an exact number of informants. The researcher decides what must be known and built out to find a voluntary individual to provide the information by the integrity of education or experience (Bernard, 2002).

For this qualitative research, the participants selected are five secondary school teachers who teach mathematics and sixteen secondary students aged 13 years old to 17 years old from schools in the southern region of Johor. Students of this age range were chosen because pupils of lower age will be less suitable as the research involved a focus group session. This age range involved students from form 1 to form 5 of secondary school that learn mathematics as a compulsory subject. According to the interview protocol, the informants who anticipated may have given sufficient information to answer the questions.

C. Instrument

Data were collected through a semi-structured interview and focus group session. The interview was conducted using an interview protocol as a guide. The questions asked during the interview are as below:

1. How should a good mathematics teacher be?
2. What qualities do you like about (your) mathematics teacher?
3. In your opinion, (if you are) what makes you or will make you a good mathematics teacher?

D. Data Analysis

Data collected were analysed using thematic analysis, following Braun, Virginia and Clarke, Victoria (2006) recommendation. The interviews and focus group sessions were recorded using an audio recorder and transcribed by the researcher. The transcriptions were re-read several

times before the coding process, and the emerging sub-themes were conceptualised and categorised into two major themes. An expert for its consistency then cross-checked the themes.

IV. RESULT AND DISCUSSION

A. The Characteristics of a Good Mathematics Teacher from the Teachers' Point of View

The characteristics of a good mathematics teacher were described using five main criteria: awareness in mathematics education, teacher's knowledge, teaching styles, personality, and the teacher-student relationship. Each criterion is composed of a set of acceptable characteristics to the students.

1. Awareness in Mathematics Education

The first main criteria that lead to the characteristics of a good mathematics teacher from a mathematics teacher's point of view is the mathematics teacher's awareness in the field of the mathematics education field.

Mathematics awareness is crucial for a teacher to notice, articulate, and interprets aspects of classroom practice. Awareness in this context refers to the teacher's knowledge and is rooted in the context of the actual classroom situations (Potari, 2013).

Quotation from Teacher 1 directly described the importance of high motivation in molding the characteristics of a good mathematics teacher.

"...A mathematics teacher who enters her class with spirit and looks enthusiastic is the best, bringing all the motivation into her class..." (Teacher 1).

From mathematics teachers' opinions, a good mathematics teacher should be aware that their motivation affects their teaching.

'...I believe a mathematics teacher who enters her class with high spirit and enthusiasm is the best, bringing all the motivation into her class...' (Teacher 1).

Motivation can affect our human psychology in various ways. In teaching mathematics, a mathematics teacher should have high motivation and passion, reflecting the inner spirit with their teaching physical appearance during the teaching process. An enthusiastic teacher presenting the subject matter leaves a great impression on their students (Onwuegbuzie & Withcer, 1999).

A good mathematics teacher should be aware that their motivation can affect their teaching (Vale & Barbosa, 2015). In teaching mathematics, a mathematics teacher should have high motivation and passion (Tan & Halili, 2015), reflecting the inner spirit of their education during the teaching process.

Besides the awareness of having high motivation in teaching mathematics, mathematics teachers also believe that a good mathematics teacher also needs to heighten awareness of the mathematics anxiety issue (Zakaria & Nordin, 2008). Without knowledge of this issue, it is more likely for a mathematics teacher to do more harm than good (Yanuarto, 2016).

Teacher 3 and Teacher 4 mentioned the importance of mathematics teachers acknowledging and being aware of mathematics anxiety symptoms among students.

"...Mathematics teachers should be observant in monitoring classes; mathematics anxiety among students is something that mathematics teachers should be cautious about..." (Teacher 3).

"The assumption that mathematics anxiety started in school is partially false. Parents, too, play vital roles in these situations, and home is the start of everything. But of course, teachers too play a very crucial part in this, and being aware is the start." (Teacher 4).

Yanuarto also supports these opinions of mathematics teachers participants in his paper; mathematics anxiety has its roots in teaching and teachers. It has been tied to the poor academic performance of students and the effectiveness of elementary mathematics teachers.

2. *Mathematics Teacher's Knowledge*

The second criterion mathematics teachers mention in becoming a good mathematics teacher is the teacher's knowledge of the subject. According to them, general knowledge and syllabus/content knowledge are the two types of knowledge specifically essential for a good

mathematics teacher (Wilson, Cooney & Stinson, 2005b).

Three out of five teachers mentioned the importance of general knowledge in teaching mathematics. Teacher 1 said that the mathematics teacher could make the subject more relevant, connecting the world to calculus with general knowledge.

"...In teaching mathematics, general knowledge is important to make the subject more relevant, connecting the world to calculus..." (Teacher 1).

With high general knowledge, mathematics will be able to relate facts with the mathematics topics, making the lesson interesting and, at the same time, relevant to the students. The statement is also supported by Teacher 3, quoted below.

"...Students are more interested in a mathematics teacher when she could relate the lesson to the real and more understandable fact like, about how the ice on the north pole is melting, how fast the sunbeam penetrates our atmosphere rather than how to find m in a linear equation..." (Teacher 3).

The participating teachers agreed that a good mathematics teacher should possess vast general knowledge and mastery in the syllabus/content knowledge. A mathematics teacher with good general knowledge can make mathematics lessons more exciting and relevant (Ifeanyi, 2016).

Mathematics teachers' participants have also mentioned and stressed this matter during the interview session as described below.

"...Only with a deep understanding of the content knowledge can a teacher teach the subject confidently ..." (Teacher 1).

"...To teach mathematic, a mathematics teacher should be very familiar with the mathematics syllabus ..." (Teacher 4).

A good mathematics teacher should understand and be familiar with the mathematics syllabus/content knowledge to teach (Sibel Yesildere, 2017) confidently.

3. Teaching styles

Teaching styles are how a teacher instructs, conducts the classroom, sources management, and assesses frequency. The majority of the participating mathematics teachers in this study agreed that a good mathematics teacher would give simple instructions during a lesson (Pang, 2009) so that students could easily understand the concept before progressing to more complex and challenging topic lessons. Besides, the teachers also mentioned that a mathematics teacher must teach mathematics in a fun and hands-on way to encourage the students' curiosity.

"...Mathematics instruction must be simple, but follow the order and rules ..." (Teacher 1).

"...a good mathematics teacher is a teacher who can give instructions in the simplest form. Able to explain lengthy questions without making it sounds hard ..." (Teacher 3).

"...A good mathematics teacher is a teacher who can stay on the same wavelength of his/he students, able to lower down their thinking way and flexible in suiting their style to their student's ability... A good mathematics teacher would use more hands-on examples when giving an example rather than just explaining through chalk and talk. When giving explanations hands-on, students would have more time thinking of the explanations, why such a thing happens, then imagining how it happens. Presenting concepts visually helps students to learn better through visual presentation...." (Teacher 2).

Another point highlighted by the participating teachers was the ability to incorporate technology into their lesson plans. They agreed that a good and innovative mathematics teacher would be able to use and adapt the technology to their teaching session (Wastiau *et. al.,* 2009; Lou *et. al.,* 2012; Kim *et al.,* 2019) to boost the interests of the students and for better understanding. This statement was highlighted as mentioned by one of the teacher participants during the interview session.

"...It is a bonus to have a mathematics teacher who is familiar with technology and able to apply technology in their teaching. This is because today's children have technology literacy and can understand the lesson better through technology ..." (Teacher 2).

A good mathematics teacher should monitor and conduct regular classroom assessments (Kunter *et. al.,* 2008; Anthony & Walshaw, 2014; Stronge *et al.,* 2011) to gauge students' understanding and issues before proceeding with different topics. Frequent assessments enable the mathematics teacher to determine whether the teaching session was conducted effectively and whether they could correctly grasp the lesson (Ifeanyi, 2016; Zhang *et al.,* 2017).

Lastly, mathematics teacher participants also mentioned that teaching problem-solving skills is fundamental in today's mathematics subject (Chigonga, 2017).

"...A good mathematics teacher should conduct classroom assessments regularly, and this is to tackle any problems before it gets bigger; the teacher cares about the students' academic progress, their understanding, their achievement, and their performance. In monitoring all these, a regular assessment is needed ..." (Teacher 2).

A mathematics teacher is considered good when the teacher can implant problem-solving thinking skills into the students (Murray, 2011; Palraj, DeWitt, & Alias, 2017). Solving problem-solving questions in today's mathematics subject is not the only focus on solving problems that involve calculations. Today's mathematics emphasises students' ability to think critically, creatively, and gain general knowledge (Lince, 2016). A mathematics teacher is considered very good when the teacher can make a strategy for students to be interested and think about solving a specific problem.

4. Personalities

Another criterion that the participating mathematics teachers consider is their personalities. They defined personality as the attitude of the mathematics teacher. They claimed that how a teacher presents themself during and after class reflects a good mathematics teacher (Haider & Jalal, 2018).

"...I am a very energetic person. When I enter the classroom, students expect what they don't expect during my lesson, sometimes it's hard to control the class, but I think it's good when the students are active..." (Teacher 1)

"...Confidence, higher achiever students often lost interest in mathematics subject because of teacher's lack of confidence..." (Teacher 4).

The most prominent features supported by these teachers are confident and energetic. A confident teacher mirrors an excellent first impression on the students (V. Flora, 1972).

Discipline and assertiveness are other combinations of personalities that characterise a good mathematics teacher. Mathematics teacher believes that mathematics is an order importance subject; teaching mathematics can be said as teaching orders, step-by-step with a given formula.

"...teaching mathematics is like teaching orders, step-by-step and formulated, a mathematics teacher needs to be a discipline in person, so he/she could appreciate the flows of the mathematics subject itself..." (Teacher 5).

A good mathematics teacher should have this understanding in mind (Beishuizen *et al.,* 2001).

5. Teacher-student Relationship

The last criteria extracted from the interview session with all five teachers is the teacher-student relationship. All participating mathematics teachers agreed that a good teacher-student relationship could create vital, positive, and long-lasting implications for students' academic development (Raufelder *et al.,* 2016). Students who have a positive and supportive relationship with their teachers were proven to attain higher achievement than those who had more conflicts with their teachers (Rimm-Kaufman, 2019). The teachers also added that having a positive relationship doesn't mean that they can be lenient with the students, rather strict or firm with them to be adequately guided.

"...He is a very strict teacher, he teaches with the aim of his students' understanding, and he won't stop until he was sure that the students get what he is saying. He is not fierce; no one is scared of him. We like him very much..." (Teacher 1).

A good mathematics teacher who is firm has the charisma to persuade students to work hard in learning mathematics and gently push their students into getting a hold of the subject (Torres-Velasquez & Lobo, 2004). A mathematics

teacher should not be feared by the students, as fear will drive them far from enjoying the subject (Barkatsas & Malone, 2005). This option of being firm and not fierce is that an intense teacher will only make the student hate the unfavourable subject.

Unbiased is also one of the characteristics that are considered the characteristics of a good mathematics teacher from a mathematics teacher's point of view. According to Teacher 4, as the following quotation;

"*A mathematics teacher must understand that every student has a different understanding rate, some are fast learners, and some are much slower. Sometimes boys play with numbers better than girls, but sometimes girls are better at memorising formulas than boys.*" (Teacher 4).

Students are diverse (Innabi & El Sheikh, 2007). Some students can memorise the formula faster while some have higher critical thinking level, some says girls are slower in mathematics than boys, and some say boys are lazier than girls. As mathematics is based on ability and capability, mathematics teachers should understand students' possibilities (Tambychik & Meerah, 2010). The mathematics teacher should be a teacher who can treat all students fairly and accordingly, be flexible in teaching, and suit the student's preferences (Wilson *et al.,* 2005a).

To summarise, the mathematics teacher identified a good mathematics teacher's characteristics in the context of awareness in mathematics education, teacher's knowledge, teaching styles, personalities, and teacher-student relationships. From the contexts, a good mathematics teacher's extracted characteristic has a high motivation to teach mathematics, awareness of math anxiety issues, high general knowledge, and mastering the syllabus. In terms of teaching styles context, a good mathematics teacher is a teacher who uses simple instruction styles, fun, hands-on and a variety of teaching approaches. They should also possess the ability to use technology in a lesson, regular assessment management, teach problem-solving questions effectively, confident and energetic, disciplined and assertive and fun and creative in person. In the teacher-students relations context, a good mathematics teacher is a strict and firm teacher at the same time but not fierce, and the teacher is unbiased with students.

B. The Characteristics of a Good Mathematics Teacher from Students' Point of View

According to the student participants in this study, a good mathematics teacher's characteristics can be described using five criteria based on the data analysis, including the teachers' knowledge, teaching styles, teaching aids (notes, homework, and exercise), instruction delivery styles, and personalities.

1. Teacher's Knowledge

The majority of the students believe that a mathematics teacher with a high general knowledge can relate all syllabus topics with facts. For example, the teacher can start the lesson by explaining where to use the calculations or relating their prior experiences to the day's mathematics lesson.

"...A good mathematics teacher is a mathematics teacher who has a lot of fun facts and can relate the facts with the mathematics syllabus..." (Student from focus group 2)
"...Having a lot of experiences will make a teacher have a lot of stories to tell, but telling stories without objective will make us boring and consider the lesson a waste of time..." (Student from focus group 2).

Based on these students' opinions, it can be concluded that a mathematics teacher's knowledge determines the teacher's quality (Heilala, 2018).

Next, students also believe that a good mathematics teacher has a perfect understanding of the school syllabus (Samo, 2017), similar to the participating teachers' view. The majority of the students agree that mastering the school syllabus reflects the teachers' ability to teach without referring to any sources or textbooks and answering students' questions at any time.

"... I wouldn't say I like it when my teachers asked me to do mathematics questions, and then when I have a problem and go back to her, rather than help me with the issue, she commented that I should be thinking logically..." (Student from Focus Group 1).

"...A mathematics teacher should have a broad understanding of mathematics subject, then only he/she can teach us better..." (Student from Focus Group 2).

2. Teaching Styles

Students mentioned that a good mathematics teacher should explain the concepts based on real-life situations as examples.

"... It helps me understand an abstract concept when my teacher explains it by asking me to recall a certain situation and relate the situations to the concept..." (Student from Focus Group 1).

"...Relating mathematics topics with a real-life situation is the best way to explain problem-solving questions..." (Student from Focus Group 2).

Application-based explanations are easier to understand because students can recall the concept's mechanics as they have already stumbled upon it before (Education, 2007). Hence, the information is no longer new to the process but somewhat new to implementing the present knowledge. Such explanations help students understand the concepts better and faster (Ganesen, Osman, Abu & Kumar, 2020).

The second criterion in teaching styles considered relevant by the students is how the mathematics teacher teaches problem-solving skills. According to the students, a good mathematics teacher should teach problem-solving using a systematic method; teachers who practice the step-by-step approach and explain each step of the problem-solving questions in detail on the calculation step for each stage (Ling, Osman, Daud & Hussin, 2019). This notion was agreed upon by most of the students from Focus Group 1 and 2.

"...A good mathematics teacher is a teacher who can make problem-solving look easy, able to reconstruct the question without a problem, and can explain the solution by a systematic method..." (Student from Focus Group 2).

On the other hand, students also added that a good mathematics teacher uses the reward reinforcement method (Lince, 2016). According to students, mathematics subject itself is already a boring subject. When a teacher punishes students by asking them to stand outside the classroom, some would consider the punishment a lot more fun than the lesson in the school. For these students, punishments would not work. On the side, mathematics is already a stressful subject for the students. Giving students punishment may increase their stress level in attending the lesson class; this may cause them to be troubled in learning mathematics.

"...Mathematics teachers should consider stopping punishing students by wearing cardboard of "I am lazy; I did not finish my homework" around the school. Some of us were so ashamed, and one of my classmates was thinking about changing school after that incident..." (Student from Focus Group 1).

3. Teaching Aids (Notes, Homework, and Exercise)

The preparedness of teaching materials by the mathematics teachers also reflects the characteristics of the teacher. From a student's point of view, a good mathematics teacher prepares sufficient teaching materials, gives a moderate amount of homework and exercises (Sibel Yesildere-Imre, 2017), and the practice given should be arranged in levels from easy to hard (Özreçberoğlu & Çağanağa, 2018).

"...homework should not be too many, but also not too little. Many homework makes us dull, while less homework means we spent only a little time on revising..." (Student from Focus Group 1).

A good mathematics teacher should not provide too much homework if the teacher can teach adequately (Sibel Yesildere-Imre, 2017).

"...Notes and exercise should be given as a set when the teacher hands us only notes, we don't usually read it, and when the teacher gives us exercises without notes, we will have nothing to refer to..." (Student from Focus Group 1).

Notes and exercises should be distributed as a set. The teacher should solve examples before letting students complete the practice independently. Solving models problems could be guidance when the teacher is not around (Samo, 2017).

As for the exercises, students mentioned that a good mathematics teacher would arrange the exercise orderly, for example, from easy to tough questions. Such arrangements

ensure the exercise be used as a reference later on and not just as a practice.

"...When the teacher gives exercise, it will be beneficial if the activity was arranged systematically from easy questions to harder questions..." (Student from Focus Group 2).

4. Teacher's Instruction Delivery Styles

Students also believe that a good mathematics teacher should have a specific instruction delivery style different from other teachers (Adler & Davis, 2006).

"...When a teacher takes a shortcut during her lesson before explaining the complete solutions, it could sometimes confuse us even more..." (Student from Focus Group 1).

A good mathematics teacher would deliver the instructions in order, as they would be able to reconstruct questions to suit the students' understanding using simple words and standard terms (Anthony & Walshaw, 2014). Like the step-by-step method employed to solve mathematical problems, a good mathematics teacher should ensure that the instruction is constructed to deliver the message without missing any points effectively. Skipping a step would render the mathematical question wrong (Martinez-Sierra, 2014).

Lastly, according to students, when reading out questions in a mathematics class, a good mathematics teacher should reconstruct the problem spontaneously without changing its meaning to the students' understanding.

"...When reading questions, a good mathematics teacher should be a mathematics teacher who can reconstruct the statement using simpler words to be easier for students to understand..." (Student from Focus Group 1).

"...Mathematics teacher should take her language usage seriously, using terms and words that is easy for the students to understand..." (Student from Focus Group 2).

5. Personality

A mathematics teacher's personality is also distinguished according to the student's point of view. Students highlighted three characteristics of a good mathematics teacher: lively, funny, and neat (Bullock, 2015). The mathematics teacher gives the students a good impression and image by presenting a neat appearance.

To summarise, students defined a good mathematics teacher's characteristics from knowledge context, personality, teaching styles, and how the teaching delivers instructions. In contrast with mathematics teachers, it was observed that students pay more attention to how the mathematics teacher can compare with the mathematics teacher participant's opinions, which tend to emphasise more on the mathematics teacher's knowledge and experiences.

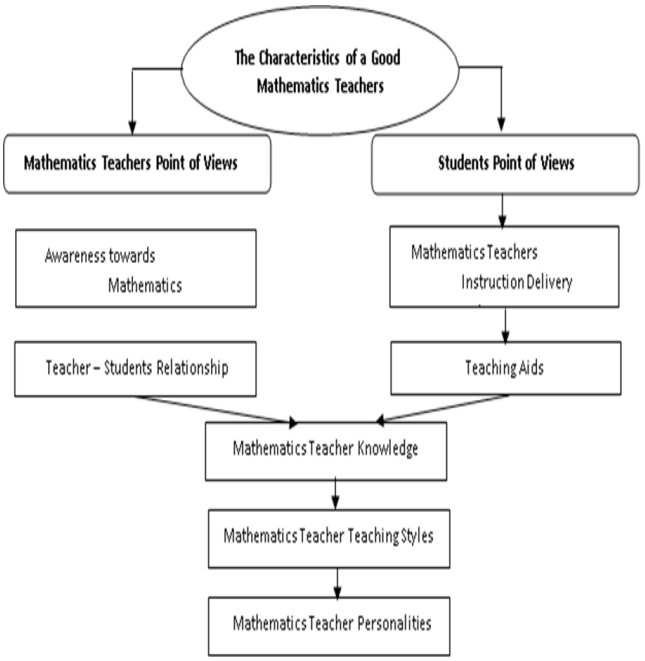

Figure 3. The summary of the findings

V. CONCLUSION

Based on the findings, it can be summarised that mathematics teachers and students possess different and similar perspectives on a good mathematics teacher's characteristics. Determining the characteristics of a good mathematics teacher is more related to the context of awareness and knowledge. According to mathematics teachers, a positive relationship between mathematics teachers and their students can positively affect the students' progress. Moreover, the participating teachers also emphasised the importance of knowledge in building a good mathematics teacher's characteristics. However, based on the student's point of view, a good mathematics teacher's

characteristic includes the teachers' instruction delivery styles, their ability in teaching, and their management of using teaching aids. But both mathematics teachers and students share the same point of view on the characteristics of a good mathematics teacher. They agree that a mathematics teacher's knowledge level is essential in determining whether the mathematics teacher is good or vice versa. Both teachers and students share similar opinions on the importance of a good mathematics teacher's teaching style and personality. While both parties agree on personalities, the teachers viewed the personality aspect in the context of attitude, especially on how they act during and after class. Meanwhile, students see the personality of mathematics teachers as a whole on their presentation or appearance, humour, and cleanliness.

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