

Teachers' Professionalism and its implications for Mathematics Content Delivery

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Abstract

Teaching is a specialized application of knowledge, skills and attributes designed to provide unique services to meet the educational needs of the individuals and society. Teaching is a noble profession that is as old as creation itself. However, no quality of education can rise above the quality of its teachers. Thus, since teaching has met the required criteria to be called a profession, its practitioners must be given adequate training in line with other professions in the world. This paper discusses in-depth the teaching profession, its standard and global best practice. It further analyzes the mathematics teaching and learning process with emphasis on developing teaching competence in a typical mathematics classroom. The paper also discusses professionalism of the mathematics teacher who must be very resourceful with skills and inclinations to create an intellectual community in the classroom. The paper provided an avenue for improvement in certain basic mathematics content pointing out the errors certain teachers make in teaching those contents. It finally recommended that adequate attention should be given to the teaching profession in terms of its funding, and that mathematics teachers' quality should be of utmost priority in order to improve the output of students in mathematics.

Keywords: Teaching, profession, mathematics, content, proficiency.

Introduction

Teaching is a noble profession that started as far back as the beginning of the world; it is the process of inculcating morals, values, abilities, skills by an experienced person formally referred to as the teacher to an inexperienced person in order to ensure positive change in behaviour useful in developing oneself and the society.

Teaching in its broadest sense, according to the Alberta Teachers Association (ATA, 2009), is a process that facilitates learning. Esu (1995) sees teaching as the act of shaping one's thought and actions through giving instruction and performing practices that creates a new behaviour and capacity. For one to be able to practice a profession,

there must be a driving force which energizes his productivity and output and this is what is called passion. Teaching is a profession where only the passion to impact lives, change generations and build nations are the driving force and motivation to deliver.

In today's society, very little attention is paid to the teaching profession; very little interest is shown in developing and building a professional teacher, and this has affected the profession. With the dwindling funding of the educational sector, the poor budgetary allocation to schools and the meagre salary paid teachers in the teaching service, this unfair treatment on the teachers and the educational sector have left the system to collapse as the day goes by and there is little or no effort by the government to rescue this falling standard of education.

On the other hand, for effective content delivery to be attained in the classrooms, especially in mathematics, adequate attention must be paid to the developing and moulding process of the mathematics teachers in order for them to be adequately equipped for the task of teaching and learning. This paper examines the extent to which teachers' professionalism influences the mathematics curriculum attainment and its content delivery in schools.

The Teaching Profession

Professionalism is a social process by which any trade or occupation transforms itself into a true profession of the highest integrity and competence. This process tends to involve establishing acceptable qualifications, a professional body or association to oversee the conduct of members of the profession and some degree of demarcation of those qualified from the unqualified (Ezeugbor, 2017).

The teacher is a person whose job is to teach, to impact, to influence the students towards attaining a certain level of learning which could be measured by a permanent change in behaviour. Erukoha (2010) opined that the teaching profession is the only profession where one-person sparks others' curiosity, steering them into being creative thinkers, not merely encyclopedias. The choice of learning activities whereby the goals of education are realized in the school is the responsibility of the teaching profession.

However, in addition to providing students with learning opportunities to meet curriculum outcomes, Arnold (1983) opines that teaching emphasizes the development of values and guides students in their social relationships. Teachers employ practices that develop positive self-concept in students. Although the work of teachers typically takes place in a classroom setting, the direct interaction between teacher and student is the single most important element in teaching.

The Alberta Teacher's Association (2009) outlined six generally accepted criteria used to define a profession, of which the teaching profession has satisfied, as follows:

1. Its members have an organized body of knowledge that separate the group from all others.
2. It serves a great social purpose.
3. There is cooperation achieved through a professional organization.
4. There is a formal period of preparation and a requirement for continuous growth and development.
5. There is a degree of autonomy accorded the professional.
6. The profession has control or influence over education standards, admissions, licensing, professional development, ethical and performance standards, and professional discipline.

All the above listed criteria are what define a profession; it is obvious that teaching has satisfied those six conditions which is why it is regarded as a profession.

Academic Path to Teaching

According to Meegan (2014), teaching is the art and science of helping others to grow in their knowledge and understanding. But more than that, teaching is constantly being aware of what you are doing wrong in the classroom and trying to find ways to fix them. There are several routes leading towards a career in teaching depending on what type of teacher one wants to become. The National Policy on Education (Federal Republic of Nigeria (FRN), 2013) asserts that since no education system can rise above the quality of its teachers, teacher's education shall continue to be given major emphasis in all educational planning and development. The Policy also stipulates that the minimum qualification for entry into the teaching profession shall be the Nigeria Certificate in Education (NCE). Accordingly, it provides that the goals of teachers' education shall be to:

- (a) Produce highly motivated, conscientious and efficient classroom teachers for all levels of the educational system.
- (b) Encourage further the spirit of enquiry and creativity in teachers.
- (c) Enhance teachers' commitment to the teaching profession.
- (d) Help teachers to fit into the social life of the community and the society at large, and enhance their commitment to national goals.
- (e) Provide teachers with the intellectual and professional background adequate for their assignment and make them adaptable to changing situations.

The National Policy on Education (FRN, 2013) as contained in the Teachers Registration Council of Nigeria (TRCN) policy note has categorized registered teachers into four groups as follows:

a) Category A (Doctoral Teachers): Holders of Ph.D. in Education or PhD in other field plus teaching qualification e.g. Post Graduate Diploma in Education (PGDE); Professional Diploma in Education (PDE); Nigeria Certificate in Education (NCE).

b) Category B (Master's Teachers): Holders of Master's degree in Education and other fields plus teaching qualification eg Post Graduate Diploma in Education (PGDE); Professional Diploma in Education (PDE); Nigeria Certificate in Education (NCE).

c) Category C (Graduate Teachers): Holders of Bachelor's degree in Education or Bachelor's degree in any other Field plus a teaching qualification e.g. PGDE, PDE, NCE.

d) Category D (NCE Teachers): Holders of the Nigeria Certificate in Education (NCE) which is the minimum qualification for teaching. This categorization is based on the provision of the TRCN Act 31 of 1993, Section 2(e).

This categorization is the requirements that must be obtained by individuals to grant them access into the classroom. However, getting the teaching certificate is a big step for educators, but teacher preparation and classroom delivery does not begin and end there. Teachers must attend professional development training in order to get use to current trends and methods of teaching which is constantly evolving.

The role of the Teachers' Registration Council of Nigeria (TRCN) here is regulating and controlling the teaching profession in all aspects and ramifications. From time to time, TRCN classifies members of the teaching profession according to their level of training and qualification. This has ensured that teaching takes the standard of a profession whereby ethics and regulation are observed. The teacher is the pivot on which the educational process rests. In fact, the importance and place of the teacher in the education process is highly prized by all nations of the world and that is why the TRCN ensures that ethics are imbibed and maintained.

Mathematics Teaching and learning

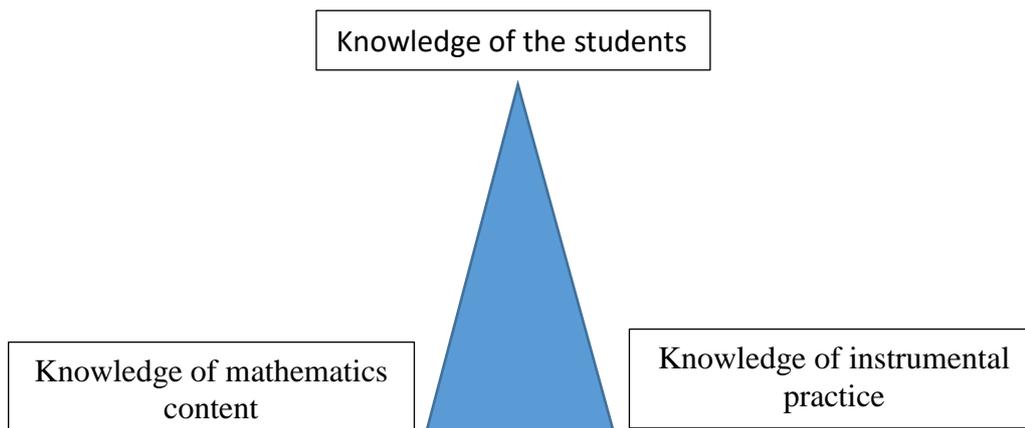
Esuong and Edoho (2018) assert that students' achievement is related to teacher's knowledge of the subject. This assertion is in tandem with the saying that "you cannot teach what you do not know". Teaching is a complex practice that draws on a broad range of resources. Despite the common myth that teaching is little more than common sense or that people are born teachers, effective teaching can be learnt. For students to develop mathematical proficiency, the teacher must have a clear vision of the goals of instruction (Udo, Esuong & Enyekeme, 2018). Teachers need to know the mathematics they teach as well as the horizons of that mathematics where it can lead and where their students are headed with it. They need to be able to use their knowledge flexibly, in practice, to appraise and adapt instructional materials, to

represent the content in honest and accessible ways, to plan and conduct instruction, and to assess what students are learning. Teachers need to be able to hear and see expression of students' mathematical ideas and to design adequate framework to accommodate their ideas.

In teaching mathematics, according to Ekwueme (2013), the teacher should interpret students' written work, analyze their reasoning and respond to the different methods they might use in solving problems. The teacher needs the ability to see the mathematical possibilities in a task, sizing it up and adapting it for a specific group of students. Ekwueme (2013) further explained that there are three kinds of knowledge crucial for teaching and learning of school mathematics. These are:

1. Knowledge of the mathematics content.
2. Knowledge of the students.
3. Knowledge of instrumental practices.

These three kinds of knowledge for mathematics teaching and learning can be summarize using a triangle



The knowledge of mathematics contents includes knowledge of mathematical facts, concepts, procedures and the relationship among them. The teacher needs to be able to understand concept correctly and perform procedures accurately because the mathematical sensibilities the teacher holds matter and translate to students' mathematical effort.

Developing Teaching Competence in Mathematics

In teacher preparation, according to Lawrence (1999), teachers cannot learn all they need to know about the mathematics they will teach, how students learn that mathematics and how to teach it effectively. Let us look at prospective elementary

school content, and how mathematics teachers can approach its teaching in a typical classroom setting.

According to Ekwueme (2013), in calculating H.C.F and L.C.M, some mathematics teachers use some unexplained procedures and shortcuts when introducing the topic which contribute to error. For instance, in solving the HCF and LCM of 12, 16 and 36, the teacher solves thus:

2	12	16	36
2	6	8	18
2	3	4	9

$$12 = 2 \times 2 \times 3 = 2^2 \times 3$$

$$16 = 2 \times 2 \times 2 \times 2 = 2^4$$

$$36 = 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2 \quad \text{LCM} = 2 \times 2 \times 3 \times 3 = 36$$

This method of solving HCF and LCM of numbers does not give room for students to comprehend the mathematical principles involved in such calculations.

Remedy: first get their multiples and factors like

Factors of 12 = 1, 2, 3, 4, 6 and 12

Factors of 16 = 1, 2, 4, 8, 16

Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36

∴ Factors common to the three numbers are 1, 2, 4

Highest common factor (HCF) is 4

On the other hand, we find the multiple of each of the numbers and then take the lowest common multiple

Multiple of 12 = 12, 24, 48, 60, 72, 84, 96, 108, 120, 132, 144

Multiple of 16 = 16, 32, 48, 64, 80, 96, 112, 128, 144

Multiple of 36 = 36, 72, 108, 144

Common multiple = 144

Several other contents can be applied and simplified to bring out students' ingenuity in mathematics.

Conclusion

No quality of education can rise above the quality of its teachers. Teaching is the mother of all professions therefore the process of recruiting members into this profession must be given top priority in educational planning and development. The National Policy on Education has spelt out criteria and qualification one must meet to be allowed to practice the profession. The implementation of this policy has suffered much setback despite the intervention of the Teachers Registration Council of Nigeria (TRCN).

Nevertheless, mathematics education is the practice of teaching and learning mathematics that meets the needs of students and teachers in the classroom. Mathematics teachers should have adequate knowledge of representing mathematics content for easy understanding. This cannot be achieved if the quality of mathematics teachers in terms of mastery of content and teaching pedagogy is dwindling. Thus, proper development of skills and techniques of impacting some common mathematics content must be given much priority.

Recommendations

1. The teaching profession should be given the adequate attention it requires since it meets all six criteria set to be a profession. Therefore, its processes of admission, its funding, quality of training and induction ceremony should as a matter of urgency be made to global standards and best practices.

2. The quality of students' output in mathematics depends largely on the quality of teachers who teach mathematics, thus effort must be targeted towards the training process of the mathematics teachers in order to equip them adequately on the contents.

3. Retraining and in-service training should be intensified in order to strengthen the teacher with modern methodology and innovations in the teaching and learning process of mathematics. This would enable the mathematics teacher to be abreast with the societal demands on him.

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