How do instructors own mathematical understandings influence their teaching resea...

Profession, Student

Mathematics is a discipline that progresses from lower grades in elementary schools to higher institutions. This means that the dissemination of mathematical knowledge by the instructor is instrumental right from lower grades. The acquisition of mathematical knowledge at any level of learning is not only aimed at benefiting students in a classroom environment but is also a lifelong tool that students can use in their lives. In the light of this supposition, the knowledge of mathematics should not be perceived as a skill that is only applicable in the classroom environment, but a trade that is meant to help students in their future life. One of the ways that an instructor should be able to instill mathematical knowledge in students is making sure that students do not focus on the quantity of mathematical concepts that they learn but the quality. Quality in this case refers to the proportion of the mathematical concepts in the classroom environment that is applicable in real life situations. It is important to understand that many students attend classes for the sole purpose of acquiring credit but not to retain the knowledge that they attain from a given class. Therefore, the focusing on quantity in terms of mathematical understanding is not helpful to the student. Instructors should make sure that students are able to retain as much as they can from a give classroom environment or mathematics lesson.

Considering that applicability, quality, and overall retention of mathematical knowledge by students is the most important thing in the learning environment; it is important that instructors prioritize of what students must learn and what must not necessarily be taught. Instructors have deep knowledge in their field of teaching because they have spent lengthy periods

in colleges and other institutions of higher learning perfecting on the trade. However, it is important to note that the student fraternity in any class is diverse (Sobel, 1975, p. 124). There are students who sit in a mathematics class yet they are theatre majors or other unrelated fields in the social sciences. These students are not interested in learning many concepts in calculus and trigonometry because such detail does not benefit them in any way. Therefore, there is a need for instructors to be in a position to sift the knowledge that they pass down to students.

Prioritizing on the course material is an important strategy that mathematics instructors can be able to effectively instill mathematical knowledge, concepts and understanding in their students. This means that instructors have to spend enough time preparing for the course curriculum long before the school term starts. In this way, only the important elements are taught to the students. This enhances the general retention quality of students that are successfully completing a given mathematics course. Despite the assumption that instructors have deep knowledge in the subjects that they teach, it is important to understand that instructors might have a higher expectation of their student when they are preparing to teach a given course (Sobel, 1999, 47). However, when the course is put into practice, it turns out that the expectations and the objectives that are set out for the course remain unmet.

Flexibility is a key component that instructors should possess in the process of disseminating their deep knowledge in a given subject to their students. This means that the course syllabuses that are set out for a given class term do not have to be necessarily be followed to the letter. This is because the

instructor might spend more time on a given mathematical topic or concept than was planned. Rushing through the course is not important, but making sure that students understand what is taught is the most important thing that instructors should be focusing on. This means that in spite of the deep knowledge that instructors possess in the field of mathematics they have to be ready to compromise with the pace of understanding of students. Topic areas where instructors feel that students are struggling and that there is a need for more time should not be rushed. Students should be given the time that they need so that they can feel comfortable with the topic areas that are taught. Considering that flexibility is a key component that mathematics instructors should possess, it is important to understand that instructors have to make sure that their flexibility is not taken advantage of by students. Many students would like to have lesser material covered in a course so that they do not have to read widely in case of quizzes and examinations. Therefore, there has to be a regulation of the level of compromise that mathematics instructors extend to their students.

Unlike theoretical subjects in the social sciences, mathematics requires constant practice so as to apply similar concepts in solving other related mathematical problems. This means that instructors should make sure that they are continually giving assignments to students so that the students continually practice on the concepts and material that they learn in the classroom environment. This would mean that instructors in mathematics subjects should make sure that there students have regular graded home works which helps the instructor to ascertain that their students are continually reading the material that is given to them in the classroom

environment. In order to enhance practice and perfectibility by students in various topic areas in mathematics it is important that instructors help foster group works and study teams that help students to improve on their weaknesses. Students might at times be comfortable asking questions to their peers and not the instructors. This means that despite the fact that the ultimate responsibility of teaching lies with the instructor, it is prudent that the instructor makes that students are able to benefit from each other. Team work is a way that instructors can be able to make sure that there is a collective understanding among students regarding various concepts in the classroom environment. Through team work, instructors make sure that every student in the classroom environment meets a certain level of understanding regarding the concepts that are being taught in the classroom.

Despite the fact that students should demonstrate a certain level of understanding of the material taught in the classroom environment. It is important that instructors help produce students that are problem solvers. Mathematics is a subject that is used across various disciplines as a problem solving mechanisms. It is through mathematical analysis that sociologists are able to create empirical arguments regarding various predicaments that are facing society. Other fields like business and economics employ mathematical knowledge in being able to analyze shifts in markets and the expected outcomes of those markets. Therefore, instructors should help students understand that mathematical knowledge is not only applicable in the field of mathematics but mathematical concepts are used across disciplines in the solving of different problems in those fields (Grouws, 1992,

p. 81). Therefore, students should not take for granted some of the mathematical concepts that they learn in mathematics lesson because those same concepts might be used in other disciplines that students might undertake in the future. Therefore, instructors in mathematics need to use their own knowledge to make sure that their teaching practice facilitates students to make effort to understand some of the concepts because it will help them in the future in life and in other disciplines.

Mathematics instructors might at times have great knowledge in themselves but lack the technical knowhow about how to effectively disseminate that knowledge to their students. Some instructors might assume that some of the concepts are very easy such that each of the students have to understand those terms. This might not be the case because not every student is gifted with mathematical knowledge. Therefore, instructors should make sure that all the intended material is covered in detail despite how simplistic that material appears. In addition, mathematics instructors should create enough time to address the questions and concern that students may have regarding a give topic outside the classroom environment. In this way, students who feel that they did not have a great understanding in the classroom can have their problems addressed and answered.

In conclusion, mathematics instructors have great knowledge in the field. However, the dissemination process of that knowledge to students should be effective. Mathematics instructors should seek to promote quality learning and understand and not embark on large workloads that are inapplicable in the future. Instructors can use their own knowledge to make sure that they prepare their students to be problem solvers by making sure that

mathematics goes beyond the classroom environment into the students' lives and future careers.

References

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