

Integration and Differentiation for Mathematically Challenged Student

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Abstract: This paper discusses, briefly on the requirements that can result in integration of mathematically challenged students. The paper also presents instructional differentiation required for meeting the needs of such students having Math phobia

1 INTRODUCTION

Students of any class cannot be a homogeneous lot, as it includes learners with varied cultural, educational and economic background. Accordingly, teachers need using strategic tools to deal with learning disabilities and phobia. However, learning process for mathematical class is different from that involved in teaching any language such as English. Teaching and learning of Math has challenges in the form of facing concerns posed by mathematically challenged students or those having Math phobia. Hence, integration of such students is essential, while course instructions need differentiation to suit the needs of such students. This paper discusses some of these requirements, in brief.

2 Integrating students through differentiation

Every class has students comprising of all skill levels and aptitudes. While certain students find interest in learning Math, few others may be afraid of even beginning with this learning process. Hence, it is the responsibility of teaching community to help all students by motivating them towards looking at this subject with interest. The first essential rule in this process deals with accepting the fact that different students would never have same skill-level. Accordingly, teachers need working hard with students while understanding their needs, interests and aptitude toward Math. One way of doing this is through differentiation of teaching instructions that can suit students with different needs. This process can support students having different learning needs, developmental skills and achieving levels.

Differentiation means acknowledgement of different academic levels of students to enable modification of instructions in a manner that can ensure achievement by all students irrespective of their aptitude and phobia towards subjects such as Math. Tomlinson, being an expert in differentiation, informs about the reasons for any learner needing differentiation. Readiness is the level of aptitude and interest required by the student to try motivation. As motivation generates interest of the student in a specific topic, the classroom instructions should remain oriented to such interest. In addition, teachers need making continuous modification to the instructions for matching them with learning profile of students. This profile includes learning modality, special needs, cultural differences and developmental levels of any student. (Differentiation)

3 Assessment as a tool to enable integration

In support to good instructional practice, assessment can improve mathematical learning, specifically among students having Math phobia. As assessment is an important part of learning and teaching process, it provides integration by identifying issues related to misunderstandings and understandings by teachers and students to enable improvement in mathematical learning. Hence, assessment and instruction compliment and support each other, to ensure better integration of students having different skill levels.

As assessments help students, teachers and parents to identify their goals towards learning process, self-assessment in Math provides an opportunity to students for identifying their needs and resources that they can use for meeting their goals. Through self-assessment, students learn to develop the intellectual processes and structures that go beyond learning specific skills needed for any mathematical operation. In addition, the assessment as a tool helps integration of mathematically challenged students by learning through interaction with other students. In the process, these students are able to acquire new mathematical knowledge through assessment-based learning.

The development of competence follows instructional teaching and self-assessment. While learning in school, students encounter new mathematical concepts in higher classes, which they are not able to relate to their existing knowledge of Math. However, they slowly discover their hidden relationship and learn to connect the new ideas, thus developing their own method of solving and tackling a problem while monitoring their own thinking.

According to authors of Mathematical Sciences Education Board (nd), there are many indicators of such competence. While proficient learners look at problem structures as they solve it, novices cannot go beyond looking at the visible task features. Experts are able to use knowledge effectively and at appropriate time. Experts are able coordinating their thinking processes with automated skills, resulting in efficient and fast performance. Tool of competence enables students developing their skills to enable them monitor and direct their performance. This way competence helps in achieving integration for students who started learning with Math phobia. (Mathematical Sciences, nd)

4 Role of teaching community

During the last few decades, the role of teaching community has not been limited to being a conventional “answer or information giver”. This role has now taken the form of teacher as a guide, observer, facilitator and listener. This means integration of not only the students, with varied skill levels, but integrating the mathematical tasks as well. Accordingly, this involves cross-strand, cross-subject and cross-category integration with increased group work and use of technology. The focus remains on development of strategies to solve any problem, rather than aiming to find a single correct answer. Hence, teachers have significant role in changing the teaching practices, while getting prepared for changing their belief and knowledge about mathematical teaching and learning. (A Vision, nd)

7 Conclusion

While mathematically challenged students as well as those with Math phobia face additional challenges in learning mathematical skills, it is essential to involve them in the process of classroom integration. The job entails greater responsibilities on teaching community to bring reforms that can address to the special needs of such students. Accordingly, differentiation in instructional procedures is required so that students are comfortable learning at their own pace, as they aim to meet the goals of Math class.

REFERENCES

- [1] A Vision for Learning Mathematics, Book from Corwin.com, Retrieved on March 09, 2016, from: http://www.corwin.com/upm-data/25988_Chapter_1.pdf
- [2] Differentiation, (nd), Differentiating instructions, Chapter 8 readings, teachersasleaders.org Retrieved on 09 March 2016, from: http://teachingasleadership.org/sites/default/files/Related-Readings/IPD_Ch8_2011.pdf
- [3] Mathematical Sciences Education Board, (1993), Chapter 4: ASSESSING TO SUPPORT MATHEMATICS LEARNING, Measuring What Counts, A Conceptual Guide for Mathematical Assessment, Open Book from THE NATIONAL ACADEMIC PRESS, Retrieved on 09 March 2016 from: <http://www.nap.edu/read/2235/chapter/6#68>