

# Use of Ability Grouping in Mathematics Teaching

- Jasbir Roka

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## Abstract

Grouping by ability refers to procedures of classes formation based on students' academic achievement. The main purpose of the study is to analyze relation between ability grouping and mathematics achievement at secondary level. As a qualitative study, the information has been collected through research articles, books, and reliable documents. It is found that their ability grouping is more beneficial to high-level students rather than low level-students. Also it is found that the majority of mathematics teachers and gifted/talented student have positive attitudes towards grouping by students' abilities. It is recommended that mixed-ability grouping should be used in the context of mathematics classrooms in Nepal.

**Keywords:** grouping, mathematics achievement, classroom practice, mixed-ability.

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## Introduction

Ability grouping is the process of division of students in the classroom based on their ability. In this relation, Bolick and Rogowsky (2016) stated that "ability grouping is an educational approach that places students in groups based on their academic achievement" (p.41). The ability grouping can be form the various basis of students in the classroom. In this regard, there are mainly six types of ability grouping as streaming, banding, setting, mixed ability, within-class ability grouping, and cross-age grouping (Ireson & Hallam, 2001, p.10). On the other hand, Tieso (2003) focused that three common groups as a whole class, between class, and within-class flexible groups based on diverse learners in the classroom. Initially, the ability grouping was introduced in an American classroom. Teachers have used it to fulfill the needs of students and improving their learning achievement (Bolick & Rogowsky, 2016). It is the most argumentative issue in American education and being practiced in the United States class from the 19<sup>th</sup> century (Fulgini et al., 1995; Betts & Shkolnik, 2000). Thus grouping by ability is a major practice in educational intuition internally.

Ability grouping is the common practice

in a mathematics classroom in the context of Nepal. In the case of school education, class sections are divided based on the marks obtained by the students in final exam. Thus, dividing the students based on the marks there could be created a gap between them. It seems that ability grouping is a major issue in the context of the school-level education system in Nepal. In this context, Panthi et al. (2021) argued that students are not getting equal opportunities to learn in the mathematics classroom. They reported that most teachers are not aware of the diverse backgrounds and social justice of the students. Since Nepal is full of a diverse country. So students are not able to learn mathematics through a particular method due to they come to school from various backgrounds as cultural, linguistic religious, ethnic, marginalized, and disadvantaged groups (Panthi & Belbase, 2017). On the other hand, from the teachers' point of view, it is usual practice and essay to deliver teaching mathematics according to their ability based grouping in the classroom. This makes it easier for teachers to identify students' problems and teach based on their needs and ability in the mathematics classroom. Similarly, school administrative perspective, it benefits to make an educational

plan and know students' performance in the classroom. But, it does not create a competitive learning environment among all the students to each other and also does not give the lower achiever students a sense of inferiority and they do not get the opportunity to learn from the high achiever students.

### **Objectives**

The main purpose of the study is to analyze relation between ability grouping and mathematics achievement and to explore the perception of teachers and students in ability grouping in the context of mathematics classroom in Nepal.

### **Method**

This study was qualitative research in which the researcher has done the qualitative analysis of data through a research articles, books, and reliable documents and document analysis.

### **Results and Discussion**

#### **Relation Between Ability Grouping and Mathematics Achievement**

Ability grouping is a familiar practice in the context of mathematics classrooms (Zevenbergen, 2005). There is a relation between ability grouping and students' achievement. In this context, Kullik and Kulik (1987) noted that ability grouping affects student achievement. Moreover, talented students were more advantageous by within-class grouping in heterogeneous classes. As well, Ireson and Hallam (2001) claimed that ability grouping positively affects learners' attainment at primary to secondary level whereas low achievement mathematics students are more beneficial by mixed ability grouping. In the context of the United States, within-class ability grouping has been used in mathematics teaching at the elementary level (Webel & Dwiggins, 2019). Thus ability grouping creates a gap between high-level students and low-level students. It is not equally beneficial for all students in the

mathematics classroom. In this regard, Hoffer (2016) reported that "The National Council on Mathematics Education (NCME) and The National Science Teachers Association (NSTA) strongly encourage schools to seek alternatives to ability grouping. They claimed that it benefits those in the high group and hurts those in the low group" (p.223). In the context of Nepal, mainly school-level education has been adopted ability grouping as a section division on their academic achievement. It is expected that schools and class teachers will meet the needs of students and improve their learning achievement. Although it is an essay to teach and evaluate students equally in the mathematics classroom, it does discriminate against weaker students and does not have a positive effect on their mathematics achievement.

#### **Teachers-Students Perception towards Ability Grouping**

In the implementation of ability grouping, the majority of teachers and high-level learners have a positive attitude towards it in classroom teaching. Similarly, low-level learners have felt inferior, have low self-confidence and lack motivation towards class (Kim, 2012). Most teachers agreed that grouping by ability has a positive impact on the academic achievement of talented mathematics students (Nor, 2018). On another hand Macqueen, S.E. (2013) pointed that grouping by ability is the interrelated issue of inequality whereas low-achievers' learners not benefited from it. Many teachers believed that mixed-ability grouping ensures an inclusive environment for all-level students. Furthermore, the grouping provides the low-level students with positive achievement (Ireson & Hallam, 2001). Thus the perception of teacher-student towards ability grouping is mixed and controversial. In this relation, Webel and Dwiggins (2019) argued that "Teachers tend to have mixed and conflicting perspectives on ability grouping

practices in mathematics classroom" (p.8). In the case of Nepal, the academic achievement of mathematics has not better than in other subjects. On this regards Panthi and Belbase (2017) claimed that language issues, gender issues, ethnic issues, social justice issues, cultural issues, political issues, and technological issues are the main responsible factors for low achievement in mathematics. The mathematics classroom is injustice in which the teachers focused only on talented students and are not careful of all students. They are not aware of culturally responsive pedagogy and equity in the mathematics classroom. Thus, the teachers have taken the usual practice group division by abilities and they are not felt comfortable teaching in the low-level class in the mathematics classroom. They taught such classes according to high-level classes. They focused only on high-level students and dehumanized low achiever students in mathematics teaching.

#### **Recommendation: Mixed Ability Grouping**

Various studies and literature have suggested that mixed-ability grouping is more beneficial in heterogeneous classes in mathematics teaching. Weibel and Dwiggins (2019) preferred that mixed-ability grouping is more appropriate in the mathematics classroom. It is also known as a heterogeneous grouping. In this grouping, students are grouping on a random basis. In this classroom, all students get an equal chance for the learning environment and they could interact with each other (Ireson & Hallam, 2001).

Similarly, McKeen (2019) offered flexible grouping in mathematics teaching in which students are divided based on their strengths and abilities. The students are provided various learning styles through interactions with peers and supported by superiors. The role of teachers monitors and gives feedback to the students. On the other hand, social

constructivism emphasized collaboration, cooperation, helpfulness, and a collaborative learning environment whereas every student work in the group through active participation and interacts with each other, sharing ideas. The role of the teacher as facilitator provides a collaborative environment the students get the opportunity to make meaning and construct knowledge (Adams, 2006). In the context of Nepal, most of teachers and schools' leadership only focused talented students and group is formed by using students' academic achievement. The mathematics classroom is diverse. Thus, as a mathematics teacher and the nature of a mathematics classroom, mixed ability grouping should be used in teaching mathematics in the context of Nepal.

#### **Conclusion**

Ability grouping is a familiar practice in the context of mathematics classrooms internationally. Most of the studies suggested that ability grouping is more beneficial for high-level students rather than low-level students in mathematics teaching. Similarly, the perception of teacher-student towards ability grouping is mixed and controversial. It is found that the majority of mathematics teachers and gifted/talented student have positive attitudes towards grouping by students' abilities. In the context of mathematics of Nepal, mixed ability grouping should be used for better learning achievement.

#### **Author's Biography:**

**Jasbir Roka** is an Asst. Prof. of Mathematics Education in Mid-west University Nepal. Currently he is M.Phil. Scholar in Nepal Open University. He has published many papers in different reputed journals nationally and internationally. He is interested in research in Mathematics Education and special needs education. Now he is secretary of Council for Mathematics Education, Karnali Province, Nepal.

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