International Journal of Engineering, Science and Mathematics
Vol. 12 Issue 3, March 2023,
ISSN: 2320-0294 Impact Factor: 6.765
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Analysis of determining the role of mathematics in educational development

Panchwate Shamrao Gangaram
Research Scholar, Faculty of Mathematics, OPJS University

Dr. Uma Shankar Yadav
Assistant Professor, Faculty of Mathematics, OPJS University

Abstract

Since all economic processes require knowledge, mathematics lies at the center of business. Questions about the nature and scope of mathematics, its connections to the real world, and the apparent impossibility of solving certain equations remain open. There is a plethora of fantastic mental benefits that come from studying maths. The clarity, analytical ability, speed, practicality, and applicability of our mental processes are all enhanced by this. The purpose of this study is to investigate the role of mathematics in the development of human society. Secondary data from a wide range of print and digital sources (books, journals, blogs, papers) informed this study. This article demonstrates how human function, necessity, and benefit affect the use of mathematics. It discusses the role that societal expectations have in the mathematical decision-making process.

Keywords:*Educational development; Analytical thinking: India; mathematics teacher practice*

Introduction

Evidence from the development of mathematics shows that societies that prize mathematical prowess tend to flourish. The progress of technology and science is aided by mathematics. No one nation, culture, or people group can claim mathematical knowledge as their own. All of humanity has worked together to produce the current body of mathematical knowledge. Therefore, it is not an exaggeration to say that the development of mathematics mirrored the progress of civilization.**(Kilpatrick, 2020).**

Written from the viewpoint of the instructor, **(Onoshakpokaiye, 2021)** investigates the effects of the teacher's role on students' mathematical comprehension and concludes that pedagogical choices have an immediate impact on students' learning. These findings highlight the need for a more targeted approach to teaching practice, for example in the selection of planning and/or assessment instruments, as both open-endedand closed-ended questions on evaluation instruments might encourage mathematical engagement for different individuals. The findings of this study suggest that the process by which we develop our cognitive abilities is influenced not only by our aptitude but also by our personal preference **(Maass et al., 2019).**

By virtue of the diversity of students in mathematics sessions, it is encouraged to recognize the numerous techniques pupils choose to engage with mathematical information **(Santos-Trigo, 2020).** Some pupils are able to produce acceptable algebraic or functional answers when asked to accomplish a task or solve a mathematical issue, while other students supply visual or figurative solutions. Also, different graduations may show a combination of these preferences **(Rashidov&Rasulov, 2020).** An acceptance of the student's personal preference should exist, but this diversity of positions presents a challenging issue for mathematics teacher practice. This is because the teacher must cultivate the ability to recognize various mathematical practices, beyond a specific inclination or preference that the teacher possesses..

From the perspective of mathematical thinking styles, we explore how pupils prefer to grasp, think about, and express mathematics in order to identify the function of mathematics in educational development.

Methodology

Review of the relevant literature to get insight into what is already known about achieving the study aims. The choice to employ a quantitative methodology led to the development of the questionnaire. There were some Indian students among the populace. All students and people who have an interest in the function of mathematics in society and daily life constitute the target population. that is, taking part in group activities. In this case, 56 samples were taken to reflect the whole population. There were no entry requirements in terms of age, major, or academic level (undergraduate, graduate). The only prerequisite was that you be a student. There were a total of 92 invitations sent out, and 67 responses received from which 56 were representative of the community being studied. The final count of participants was 92. In keeping with what was anticipated, the usable response rate was 61% (56/92). Roughly 73% of those polled responded.

Results and analysis

The analysis and discussion of the questionnaire-based data will be covered in this chapter. To help with analytical comprehension, graphics will be used. In each of the four question categories—general questions, societal issues, cultural development questions, mathematics for everyday use, and educational development—the survey's results are analyzed and commentary is provided.

Gender

From a total of 92 sent out, we received replies from 67 different people in the form of the questionnaire. Sixty-nine percent (46) were males, while 31% (21) were females. Given these generally recognized ratios, we may conclude that the gender gap had no effect on the study's overall findings.

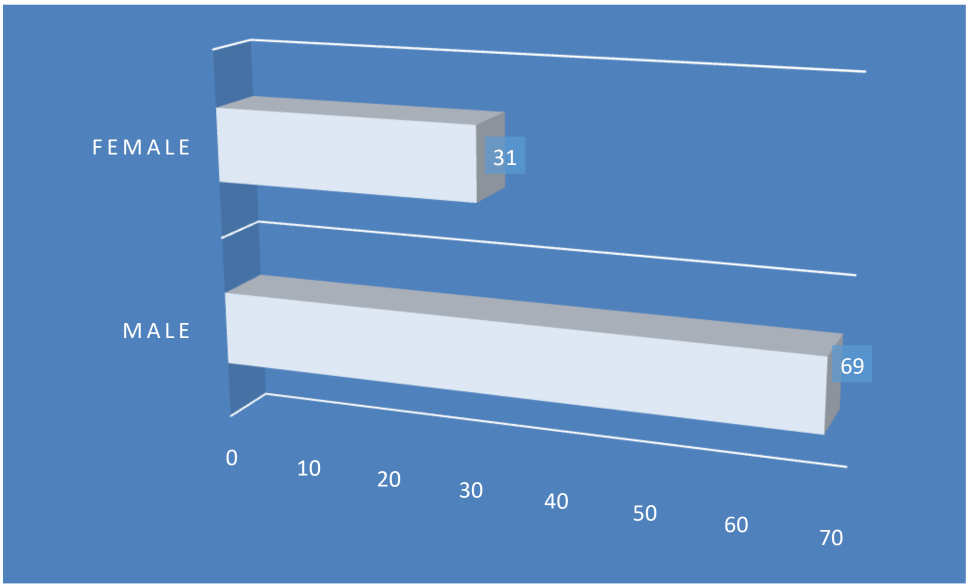

Figure 1.1: Outcomes of Gender Response

Age distribution

When asked which age group they belonged to, respondents divided themselves as follows: 58% (39 of 81) were between the ages of 21 and 24, 28% (19 of 81) were between the ages of 25 and 39, 11% (7) were in the group of 40 and over, and 3% (2) were at the age of 20 or younger.

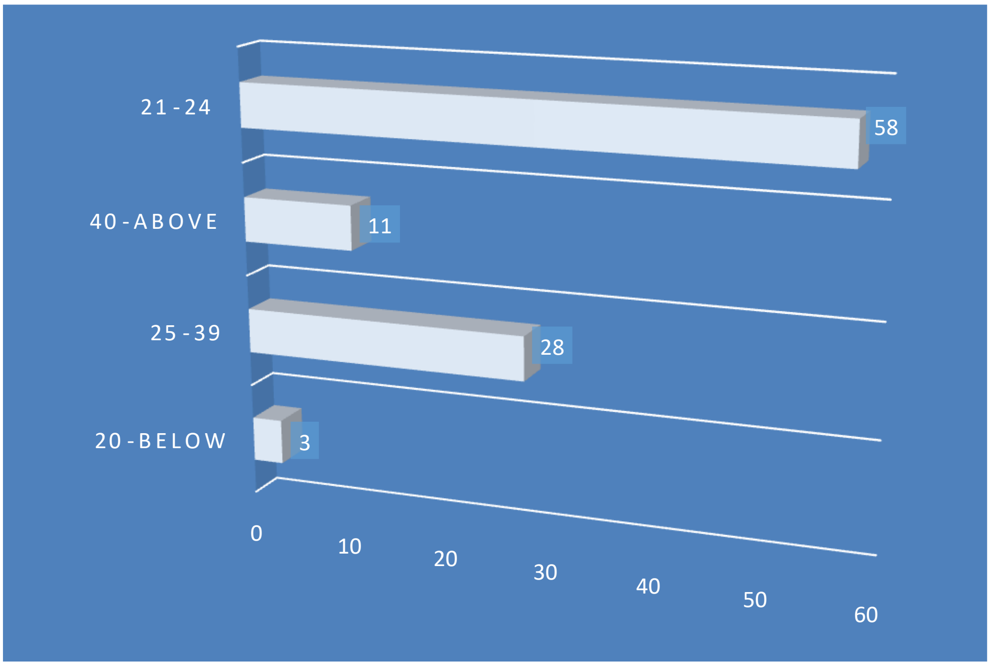

Figure 1.2: Age group findings

Educational Qualification

In the survey, respondents were asked whether they were undergraduates, graduates, or doctoral students. Sixty percent (40) of the participants were undergraduates, 37% (25) were graduates, and 3% (2) were doctoral students. The majority of responders were between the ages of 21 and 24, which is consistent with their being undergraduates.

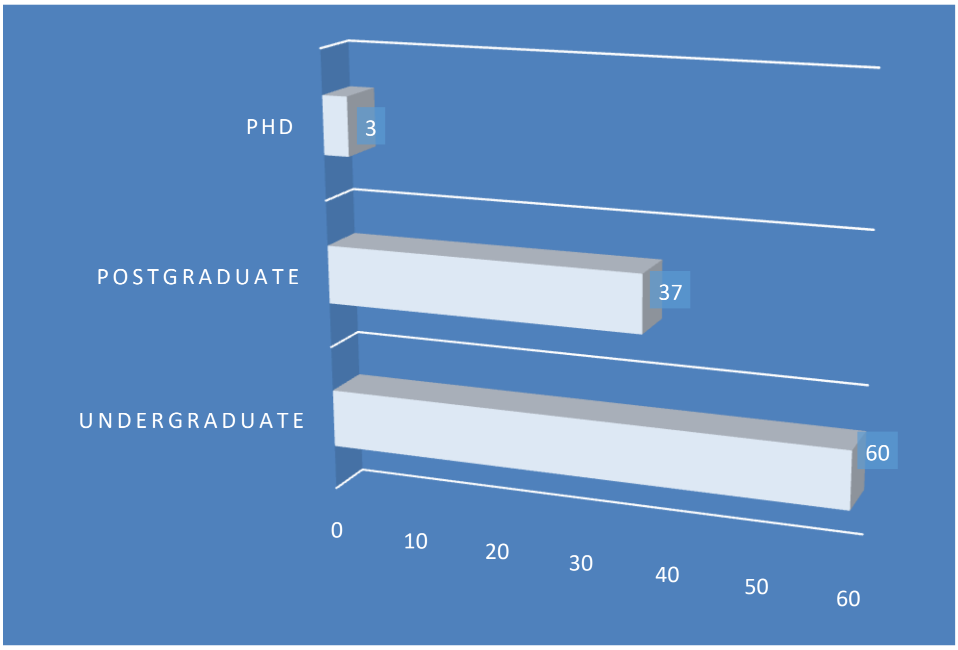

Figure 1.3: participant's educational status findings

Job Status

In a calculated move, we included a question on respondents' occupations in our survey. Of those who answered, 42% (28) were math and science teachers, 25% (17) were students, 16% (11) were non-technical staff, 11% (7) were tech staff, and 6% (4) were in some other occupation..

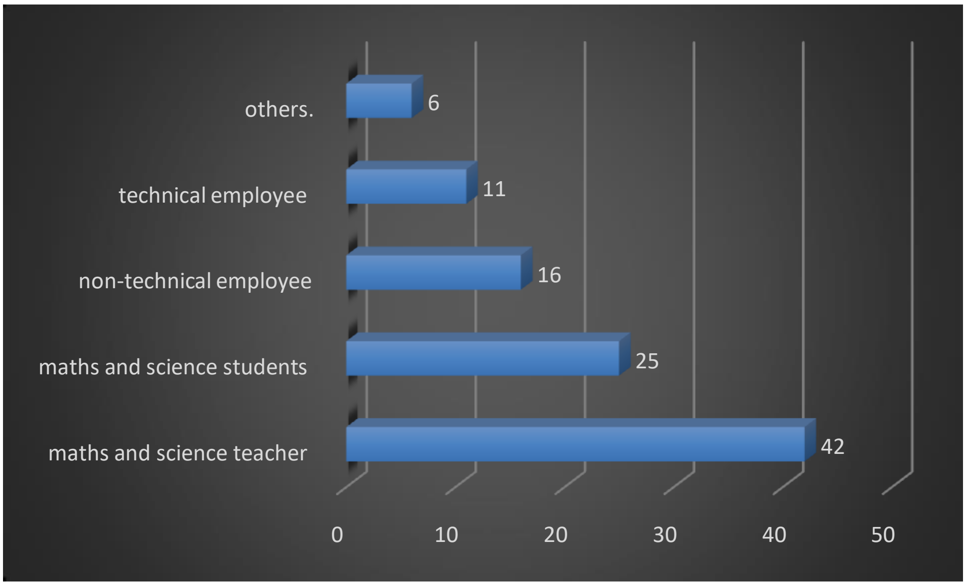

Figure 1.4: Job Status description

Location of Respondents

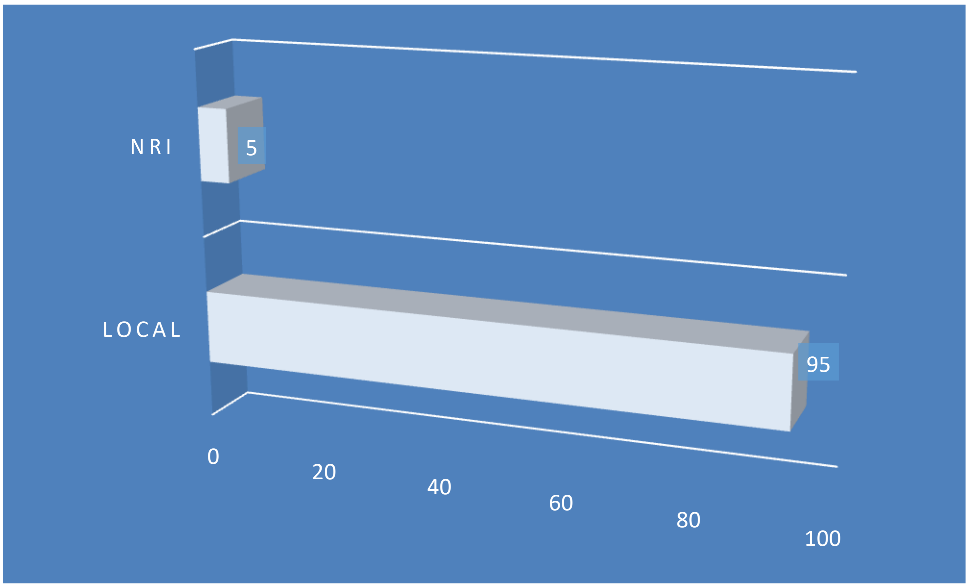

Figure 1.5: Location status description

The questionnaire allowed us to learn where each participant lived, and we found that 96% (64) of them were Indian nationals and that only 5% (4) were foreign nationals living outside of India..

1.2 Educational Development

1.2.1 Analytical Thinking

Based on findings, the different thinking styles are as follows

- **Visual thinking style**

People who are visual thinkers are more likely to understand mathematical facts and connections through holistic representations, and to have distinct internal and external pictorial imaginations. Strong linkages with experienced experiences have a profound effect on the internal imagination..

- **Analytical thinking style**

Both internal and outward formal imaginations are favored by analytic thinkers. They tend to work in a sequential fashion and can understand mathematical truths through preexisting symbolic or verbal representations.

- **Integrated thinking style**

People with this trait are able to think both visually and analytically, and they can easily shift between various mental representations and strategies.

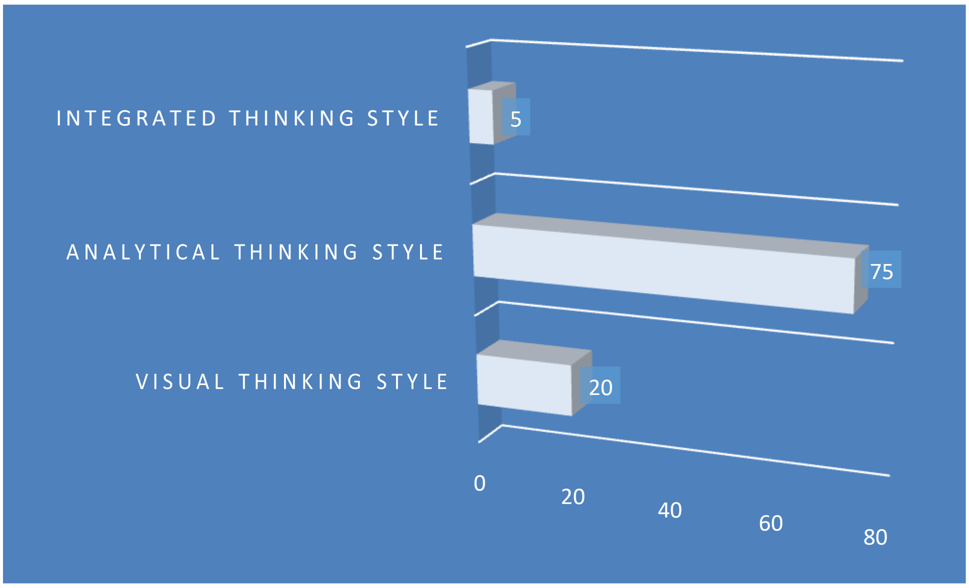

Figure 1.6 Distribution of mathematical learning style

Analyzing the preferences of students with low, moderate, high, and very high scores in mathematics, it has been shown that there are substantial disparities in the analytic thinking preferences of these groups. Students' preferences for analytical thinking were first measured, revealing that more than half (50.25percent) of those with high achievement grades lean in that direction; furthermore, those with high achievement grades have a low dispersion, making them significantly different from those with low and average achievement grades, who have a nearly total dispersion..

How can you practice various types of math problems, to develop your logic and problem-solving capabilities?

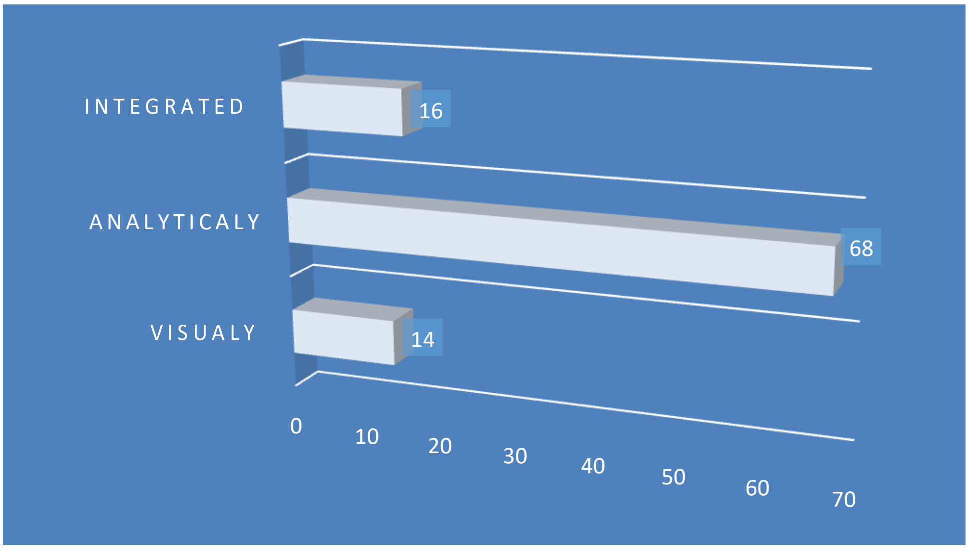

Figure 1.7 Distribution of mathematical learning style practice

There are substantial disparities between the choices of students with low (14%; 9.38), moderate (16%; 10.72), and high (75%; 45.56) analytic thinking scores when it comes to the methods by which they solve mathematical problems. It was found that students with higher achievement grades are more likely to have a preference for an analytical thinking style (68%, or 45.26%), and that this group has a lower dispersion than students with lower and average achievement grades (who have a nearly total dispersion).

Conclusion

Most mathematical ideas and components need students to think analytically and observe carefully. Teaching kids to think critically can help them in many areas, including time and money management, which will ultimately boost their arithmetic skills. Math is a topic that relies heavily on the ability to think logically and analytically. Solving math problems requires pupils to apply their reasoning skills. Mathematical proficiency can benefit from the development of analytical thinking. The ability to think analytically allows one to deconstruct a difficulty into more manageable pieces. In mathematics, it is particularly useful since it simplifies otherwise intractable problems. A person's capacity to solve problems is bolstered by their analytical abilities. This trait makes it easier to tackle mathematical topics and problems. Instead of worrying about how hard the questions are, students might learn to approach them as challenges to be overcome.

Reference

1. Onoshakpokaiye, O. (2021). The study skills; an educational implication on students' performance in secondary school mathematics. *Mathematics Education Journal*, *5*(2), 115-123.
2. Maass, K., Geiger, V., Ariza, M. R., &Goos, M. (2019). The role of mathematics in interdisciplinary STEM education. *Zdm*, *51*, 869-884.
3. Santos-Trigo, M. (2020). Problem-solving in mathematics education. *Encyclopedia of mathematics education*, 686-693.
4. Rashidov, A., &Rasulov, T. (2020). The usage of foreign experience in effective organization of teaching activities in Mathematics. *International Journal of Scientific and Technology Research*, *9*(4), 3068-3071.
5. Kilpatrick, J. (2020). History of research in mathematics education. *Encyclopedia of mathematics education*, 349-354.