

E-ISSN: 2709-9407  
P-ISSN: 2709-9393  
JMPES 2023; 4(2): 49-51  
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[www.mathematicaljournal.com](http://www.mathematicaljournal.com)  
Received: 19-09-2023  
Accepted: 26-10-2023

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## Effect of intellectual games on the development of mathematical thinking skills among students

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### Abstract

In India students have faced the paradox of Maths being the scariest; the reason as addressed by Shakuntala Devi is that it is looked upon as a subject and not a tool. Researches reveal that 82% of the students from class 7<sup>th</sup> to 10<sup>th</sup> are Arithmo-phobic. With the evolution of Gaming Era and with the changing modes of Teaching and Learning, blending intellectual games with fun-oriented learning would develop a higher interest in the students towards Maths at an unambiguous level. The present investigation has been conducted with an objective to illuminate the positive effects of introducing gaming techniques in the pedagogy of Maths and its wondrous results in developing Mathematical Thinking Skills among students in India. It would give an insight into the changes that can be brought in educating Mathematics effectively and inculcating higher order thinking skills in pupils utilizing the Cyber resources to the utmost level. The Research has been carried out at a holistic level to highlight the incredible effects of using sport or game oriented learning in the blooming of Mathematical skills in students and to ascertain that Maths is looked upon as a realistic, interesting and highly intellectual tool to resolve problems in everyday lives.

**Keywords:** Intellectual games, mathematical skills, fun-oriented learning

### Introduction

**Let us look at the names like Aryabhata, Srinivasa Ramanujana, Shakuntala Devi and think of what they have in common?**

Apart from being famous Mathematicians across the world, they are all Indians who made tremendous contributions in the various divisions and subdivisions of Maths with the evolution of time. India has been the country introducing the concept of Vedic Maths which is appreciated around the world for developing higher Mathematical Skills among students. The nation has given the world - Human Computer, which establishes the fact that human mind can be swifter and better developed than the machine. On the contrary, it seems exceptionally hard to believe in the fact that in the same country, today, only one out of every 10 students seems to be confident about their Mathematical abilities whereas the others face anxiety and fear of the same subject. An article from Indian Today dated 13 July 2021 portrays that the core reason for disconnect is the Conventional Teaching.

In India, the four-wall traditional classroom method of teaching and giving more importance on solving the problems given in the course book are responsible for turning the classroom environment monotonous and less interactive for the children. Apparently, Maths is a field which requires the active participation and brainstorming of the students' minds in an efficient and consistent manner. It is an undeniable fact that the only way of learning Mathematics is by doing Mathematics. Hence it becomes unquestionably important to keep an eye that the students don't lose their interest and continue to enjoy the essence of Maths which is nothing but developing Problem-Solving Skills. Though this might be the first time in India but it is the need of the era to inculcate online games or intellectual sport to boost the thinking abilities of children in a Maths Classroom and also to facilitate a better environment to them for uplifting their performance to their highest levels. Along with a proper pedagogical technique, inclusion of such fun-oriented activities can maximize not only their academic performance but also nurture the other skills required outside the classroom in daily life. This would definitely fill in them an extremity of zest and energy to compete and acquire better skills to outshine each other.

This qualitative study has been carried out to highlight the impact and importance of teaching Maths with the use of online or offline games and technologies and to provide a future perspective on adopting play-based teaching as a significant method of developing Mathematical skills and also, cognitive development in students of all age groups.

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Stress should be laid on embracing game-oriented learning so that an early interest is instigated in the students and leads them to enjoy practicing problems which would indirectly better their arithmetic or numerical skills. We often hear around us that Maths is not what complicates things; rather it is what makes complicated things simple. Hence, students need not to see Maths as a problem rather should believe it as a tool to solving problem in real aspects. Here, we tend to explore to the depth of this statement, its impact on young minds and promote such approach in the future classrooms.

### Methodology

Projective techniques used for re-researching the effect of using intellectual games in developing Mathematical Skills include close reading of Literature and qualitative studying as a research tool. A proficient study was done to acknowledge effective changes brought about by the adherence of games in the enlargement of thinking abilities and power in the field of Maths. A descriptive research was done that also included a detailed analysis of the various theories given by researchers regarding the relationship between intellectual educational games and logic mathematical intelligence.

The primary source of information was a meta-analytical study carried out in the Turkish region which put forth the importance and effect of game assisted Mathematics Education on the Academic Achievements of students. The researcher used Hedge's Coefficient as a tool to tabulate the collected data which further was presented using Normal Distribution Curve. By critical investigation and observation, it was concluded that the inclusion of games and other engagement activities could boost the motivation, interest, intelligence, thinking capacities and confidence of a child, consequently leading to higher academic growth and achievements.

In India, fun-oriented approach is truly adopted in Maths during the primary years of schooling of a child, where games like abacus are used to teach the concepts of Addition, subtraction or face and place value to the students. The impact of using such games is that the students not only enjoy but also retain the concepts for almost their lifetimes. But as is evident from various sources of study, the high schools' Maths Teachers somewhere lack such approach and this drifts the student's interest away from the subject. A higher priority is given to the curriculum rather than the mode pursued to develop and shape the thinking skills of a child. Conversely, a blended mode of teaching and learning of Maths skills should be followed. Though not many researchers have called attention to or worked towards acknowledging and promoting such necessary change in the pedagogy of Maths, but there have been a few more works done to promote such active environment in classrooms to stimulate higher mathematical abilities in students. After all, one must remember that Maths is not just about being a good calculator but it is also about being a creative thinker. Another article refers to an educational project co-founded by the European Union labeled as E-Magic, which enforced the educators to use serious games as a tool to instigate spark in students towards Maths. Clash of Wizardry is an arena which can help students to practice, master and become expertise in Maths by taking it as a challenge rather than a threat.

The Initiation of such an interesting game has been a remarkable effort that has been admired by all the researchers, educators and the educands. It is a fast-paced gaming platform provided to the students to win fame by acquiring the most powerful spells, where in a spell is awarded to a Wizard on

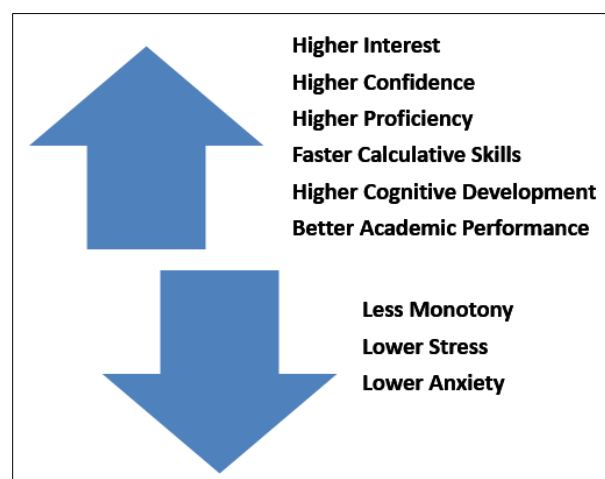
equalizing the given mathematical energies, more specifically, on solving first order linear equations. The game aims at developing skills of the students including those who might not have such affection towards this particular subject.

A close examination of the literature also brought into light the fact that the National Council of Teachers of Mathematics (NCTM) also encourages the use of such serious educational games in promoting a more pragmatic approach towards achieving Mastery of various numerical skills and also to inculcate a mathematical approach of thinking among students. Henceforth, the study draws attention towards the need and the ways of carrying action research in the same field. The future educators must also keep in mind that the way of thinking should hold more importance than reaching towards the right answer, which ultimately means that the art of framing a question is of higher significance than just solving it.

### Results and Discussion

Observational study reveals that even though quite a few researches have been carried out in fusing intellectual games with imparting Maths education, they still need to be seen with a realistic approach to make sure that they are equally implemented in today's educational practices. This shows that there is still the need to expand a fun-oriented approach towards imparting Maths Skills among the pupils so that they firstly develop competitive spirit in achieving more and believe that except the pen and paper mode, they have plethora of options to brighten their skills.

Being one of the most former countries to have contributed to Numbers, India has given the nation and its people the most avid Mathematicians of all ages who have done wonders in this field. But the major demand of the time is to inculcate an interest in the present and the coming generations and to switch to blended mode of teaching which might include educational brainy games to facilitate proficiency in Mathematics. Here, for reference we look at how counting on games to teach Maths brought about major changes in the performance as well as the perspective of the Students towards the course of advancing their Mathematical efficiency.



**Fig 1:** Effect of Intellectual Games on the Development of Mathematical Skills among Students

### Conclusion

**Based on the study the following conclusions have been drawn:** Though educators have acknowledged Online tools and technology in the pedagogy of teaching Maths post pandemic but far better efforts could be made in inclusion of

intellect-based games in developing mathematical proficiency in students. This calls for a greater work and effort to be done in the same field. Based on this research, it can therefore be concluded that use of intellectual games in pedagogy of Maths has been indisputably productive and have lead students to outstanding academic achievements, but there's a room still which needs to eradicate the myths about game-oriented approach of teaching and learning and bring the positive aspects to light.

### Acknowledgement

I replete with gratefulness to my mentor, who I believe has enlightened me to the magnificent castle of knowledge and motivation, Nishi Gupta, Associate Professor, in the Division of Maths, UIS, Chandigarh University, Punjab. She's been with me throughout the journey of my research work, blessing me with stability and amplifying my morale to make a continuous effort in bringing a Remarkable Change in the teaching and learning of Mathematical Skills among the students who come ahead. Her efforts have been highly acknowledged and appreciated.

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