Enhancing Mathematics Learning Through Instructional Humour

Dr. Amit Ahuja and Ms. Babita

Abstract

Mathematics is often associated with stress and frustration. Many people find it challenging to learn mathematical concepts, especially when learning on their own. This feeling of isolation can make the learning process even more difficult. However, incorporating humour into Mathematics education can help alleviate some of these challenges. Humour can potentially engage learners, reduce anxiety, and foster creative problem-solving skills. By exploring the intersection of humour and Mathematics education, this paper aims to uncover ways to empower learners in their mathematical journey and enhance their learning experiences. The objectives of the study are to examine the efficacy of instructional humour in Mathematics education, explore effective methods for integrating humour into Mathematics teaching practices, and analyze the influence of humour on student learning outcomes, while also investigating prevalent mathematical myths. This study suggests that educators are urged to creatively and purposefully incorporate humor into their teaching methods to boost student involvement and improve learning results. Such an approach can transform the learning environment, making Mathematics more accessible and enjoyable for all students. The educational implications have been made for the stakeholders in educational practices.

Keywords: Instructional Humour, Learning, Mathematical Myths, Mathematics Education, Problem Solving

Introduction

"A good laugh is a mighty good thing, a rather too scarce a good thing."

— Herman Melville

When, if ever, have you had an opportunity to grin in a Mathematics lesson? These days, humour might be a profoundly socially esteemed characteristic and could be found in uncountable settings of human activity. Humour is distinctly displayed in exciting activities like theatre, cinema, radio, internet, etc., therefore there is no question that it plays a vital role in releasing the pressure caused by the problems and issues of our lifestyle (Menezes et al., 2019) Within the commerce world, humour was used as an efficiency enhancer (Scheel et al., 2017). But what about the field of education? And particularly what about Mathematics education? Was there any way to utilize humour in the Mathematics classroom as an instructional value? Instructional Humour, in the context of education, involves the deliberate and strategic use of humour, including jokes, anecdotes, puns, and playful elements, to enhance the learning experience and promote engagement among students or learners (Walshaw et al., 2008). It aims to create a positive and enjoyable learning environment that fosters creativity, reduces anxiety, and facilitates the retention and application of knowledge (Garner, 2019). Even

Dr. Amit Ahuja, Associate Professor, University School of Education, Guru Gobind Singh Indraprastha University, New Delhi
Ms. Babita, Ph.D. Scholar, University School of Education, Guru Gobind Singh Indraprastha University, New Delhi

04-IJTETV4I227_p37-45.indd 37 10-07-2024 18:15:50

though laughter and smiling have been linked to a variety of health advantages, humour has remained one of the most misused strategies in education (Harrison, 1995). This research paper explores the potential benefits of integrating instructional humour into Mathematics learning experiences, examines how the deliberate use of humour as an instructional strategy can enhance the Mathematics learning journey of learners, and seeks to furnish self-learners with practical recommendations and strategies for effectively using humour in their mathematical pursuits. This research paper may offer valuable insights to educators and instructional designers finding it hard to engage and support learners in Mathematics.

Throughout history, different viewpoints or opinions on the meaning of humour used at different stages were given by many philosophers/ psychologists. Humour theories (in the broadest sense) are attempts to address these different ideas (Morreall et al., 2009). Superiority theory, Incongruity theory, and Relief theory are the three primary categories which have been discussed here:

Table 1 Theories of Humour

S. No.	Theory	Assumptions
1.	Superiority Theory	• Humour emerges when one person feels superior to another. • Humour often involves belittling the subject of the joke, leading to a sense of superiority in the one who laughs.
2.	Incongruity Theory	• Humour arises from perceived incongruity or mismatch between expectations and reality. • The unexpected or accidental contrast elicits a comedic response.
3.	Relief Theory	• Laughter serves to alleviate tension between individuals. Humour arises from situations that trigger tension. • Humour acts as a release valve, defusing stress and fostering a sense of relief.

Essentially, humour acts as a release valve, defusing stress and fostering a sense of relief (Atkinson, 2006). These theories offer valuable insights into how humour operates, providing a framework for understanding its role in educational settings and beyond.

Review of Related Literature

Humour can help overcome obstacles, enhance attention, boost cognitive abilities, and foster creativity (Powell et al., 1985; Bryant et al., 1989). It also improves self-esteem for both students and teachers, creating a more enjoyable classroom environment (Ellingson, 2018). Students respond positively to humour-infused educational activities, with a strong relationship between humour perception and engagement in learning (Masek et al., 2018). This is particularly relevant in Mathematics, where humour can make the subject more enjoyable and enhance understanding (Shmakov et al., 2010). However, the effectiveness of humour in the classroom may vary among students, with diverse tastes and perceptions (Warwick, 2009). When used appropriately, humour can uplift and engage students, foster open communication, and help them reflect on challenging topics (Ellingson, 2018). It is found that humour increases focus and interest in the

04-IJTETV4I227_p37-45.indd 38 10-07-2024 18:15:50

subject, particularly when used interactively by teachers (Gorham et al., 1990 & Hackathorn et al., 2011). Also, humour serves as a scaffold for learning, influencing various factors like student engagement, teacher interaction, task relevance, and subject matter comprehension (Matarazzo et al., 2010). Humour plays a crucial role in education, particularly in developing collaborative problem-solving skills and maintaining student interest (Civikly, 1986; Korobkin, 1988; Lamminpaa et al., 2018). It can reinforce learning, make tasks less laborious, and create a sense of group identity (Korobkin, 1988; Lamminpaa et al., 2018). Humour can also regulate negative emotions and contribute to collaborative decision-making (Lamminpaa et al., 2018). The effectiveness of humour in education depends on the establishment of a relational base (Civikly, 1986). The review of related literature shows that humour within Mathematics education includes the need to determine optimal integration strategies, considering frequency, timing, and types of humour work well. Research should extend beyond engagement to examine the impact of humour on critical thinking, problem-solving skills, and conceptual understanding in Mathematics.

Research Questions

This research paper addressed the following as supported by the review of related literature:

1. How do teachers effectively select and utilize mathematical teaching resources to incorporate humour into their lessons?
2. How can educators design tasks that humorously convey mathematical concepts to enhance student engagement and comprehension?
3. How do humourous riddles, trick problems, paradoxes, and brain teasers bridge the gap between humour and Mathematics, and contribute to students' mathematical understanding?
4. What implications does humour have for students' perception and attitude toward Mathematics?

Research Objectives

The following research objectives were supported by the research questions:

1. To examine the efficacy of instructional humour in Mathematics education at secondary level.
2. To assess secondary students' attitudes towards mathematical myths and their readiness to debunk them.

Delimitations of the Study

The study had the following delimitations:

1. The study was delimited to explore the effect of integrating instructional humour and Mathematics learning because it had been mostly neglected in Mathematics subject.
2. This study was delimited to explore the effect at secondary school level because of the significance of the developmental stage where their cognitive abilities, including abstract reasoning and understanding of humor, rapidly developed.
3. The study was delimited to be conducted in Delhi-NCR to have better control over the resources.

04-IJTETV4I227_p37-45.indd 39 10-07-2024 18:15:50

Research Design

The study employed a descriptive research design to gain insight into the role of humour in Mathematics education. This design helped in examining the relationship without manipulating variables and provided valuable insights into how humour impacts learning outcomes in Mathematics.

Sample

The sample selection involved random sampling of 20 TGT Mathematics teachers and 200 secondary level students from private and government secondary schools in West Delhi and North-West Delhi districts. This approach ensured a diverse representation of teachers and students over varied perspectives and experiences within Mathematics.

Research Tools

Research tools include Structured-interview and a 5-point Likert scale. Data analysis employed descriptive statistics for quantitative data and content analysis for qualitative data has been done.

Findings and Outcomes

i. To examine the efficacy of instructional humour in Mathematics education structured interview of Mathematics teachers at secondary school level was conducted. To effectively teach fundamental mathematical concepts and foster problem-solving skills by incorporating humour, teachers suggested employing appropriate resources and strategies, encouraging resilience and experimentation among students. It is crucial to ensure that humour is relevant to the content and strategically employed to maximize its educational benefits. Positive and inclusive humour should be prioritized, avoiding negative jokes or stereotypes that may hinder learning and create a negative classroom environment. Respondents often opt for recreational Mathematics approaches, as they find motivation in humourous puzzles, diversions, and contradictions, rather than traditional classroom methods. Teachers suggested certain fundamental elements to create or choose humourous mathematical activities. These elements include maintaining academic and intellectual quality, working in groups, long-term commitment, various ways for students to approach problems and find solutions, catering to different learning styles and abilities, connection to the curriculum, and multi-representational to convey mathematical concepts. The comprehensive table displaying the data is provided below. It's important to note that in some cases, the total percentage may exceed 100% due to respondents providing multiple responses.

While most students supported humour in the classroom to enhance learning and social interaction, they stressed the need for cautious implementation to avoid distractions. Overall, humour serves as a valuable tool in teaching and learning, fostering teacher-student rapport, relevance, and ultimately, academic success.

ii. To analyze and disprove mathematical myths at the secondary school level a 5-point Likert scale was employed to collect data from students. The majority of respondents find Mathematics boring but this is an incorrect notion as it is often presented in schools as an isolated, context-less subject, taught as a rigid set of information progressing along a predetermined complexity ladder. This approach restricts critical thinking, exploration, and the potential for future progress, as everything is presented

04-IJTETV4I227_p37-45.indd 40 10-07-2024 18:15:50

Table 2 Efficacy of Instructional Humour in Mathematics Education

Aspects	Sub-aspects	Percentage of Respondents
Perception of Instructional Humour	Sarcasm in Classroom	75%
	Humour Related to Course Material	45%
	Humour Simplifying Teachers' Instruction	35%
Preferences for Classroom Strategies	Making Strategies	75%
	Creating Learning Targets	70%
	Clarity of Thoughts	60%
Strategies for Harnessing Instructional Humour	Sharing Real Life Funny Stories	75%
	Relating Funny Examples to Mathematics	70%
	Recreating Movie Scenes	35%
	Social Play	20%
Impact of Mathematical Tasks with Humour	Eases Subject/Reduces Stress	80%
	Boosts Learning	65%
	Increases Creativity	50%
	Makes No Difference/Disrupts Class	15%
Perceived Benefits of Humour in Learning	Learning and Having Fun Simultaneously	85%
	Makes No Difference	15%

as already known and beyond critique. The lack of attribution to historical or personal contexts further disconnects students from the subject. Students suffering from math anxiety often bear misconceptions about the subject, which serve to justify their fear and dissatisfaction. Some respondents believed that math ability is inherited, there are things like math brain or math ability. Although the reality is that some individuals may show natural talents in specific areas, mathematical ability is not determined by genetics in advance. Another common misconception is that computational ability defines mathematical proficiency, leading some students to feel ashamed of doing finger counting. However, such methods are perfectly valid, similar to using a Chinese abacus. The belief that math relies only on logic and not imagination is another myth. While logic is fundamental, Mathematics also thrives on creative thinking and problem-solving. The misconception that accuracy is paramount overlooks the importance of understanding concepts over rote memorization.

The overall interpretation of 5-point Likert scale about including instructional humour in Mathematics teaching is little more than seven-tenth (71.5%) of the respondents had a positive attitude, little less than three-tenth (28.5%) of the respondents had a neutral attitude and no respondent had a negative attitude (0%).

04-IJTETV4I227_p37-45.indd 41 10-07-2024 18:15:50

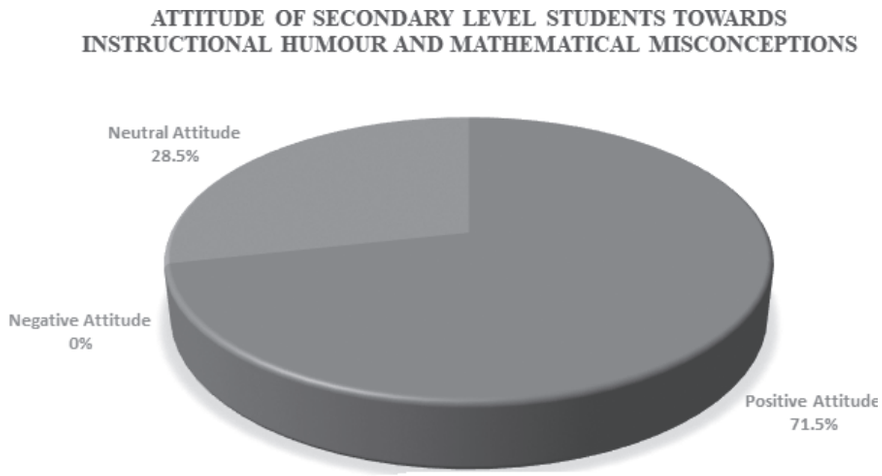


Figure 1. Relation between Instructional Humour and Students' Attitude towards Mathematical Misconceptions

The investigator utilized a chi-square test to validate the data presented in Figure 1 and determine if the prevailing attitude among students towards instructional humour was merely coincidental. Table 3 illustrates the results of the chi-square test regarding the attitude of students.

Table 3 **Chi-square Test for the Attitudinal Score of Students towards Integrating Instructional Humour in Mathematics Learning to Eliminate Mathematical Myths**

	Positive Attitude	Neutral Attitude	Negative Attitude
F_o	143	57	0
F_e	66.6	66.6	66.6
(F_o-F_e)	76.4	-9.6	-66.6
$(F_o-F_e)^2$	5836.96	92.16	4435.56
	87.642	1.384	66.6

Total Chi-squares values = 87.642 + 1.384 + 66.6 = 155.626

Degree of freedom= 3-1 = 2

The obtained chi-square value 155.626 for 2 degrees of freedom is significant at 0.01 level of significance, the chi-square test indicates that there was a strong association between students' positive attitude and the use of instructional humour in teaching Mathematics, and this association was not a coincidence. The positive attitude towards instructional humour in Mathematics teaching likely stems from its ability to enhance engagement, understanding, and enjoyment of the subject, as well as its role in creating a supportive and inclusive learning environment. There is a three-way dynamic interplay between students' perception (P) of Mathematics, the instructional environment (I) they experience, and the beliefs (B) they hold about the subject.

04-IJTETV4I227_p37-45.indd 42 10-07-2024 18:15:50

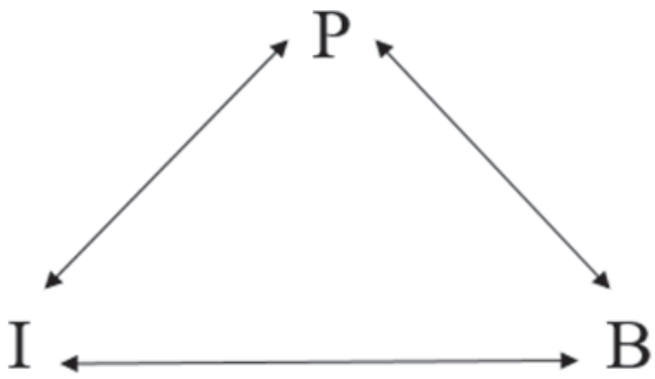


Figure 2. Three-way relationship of Perception (P), Instructional Environment (I) and Belief(B)

These factors collectively contribute to the formation of mathematical myths in students' engagement, motivation, and understanding of Mathematics which highlights the importance of addressing misconceptions and promoting effective teaching practices to enhance mathematical learning experiences.

Educational Implications

- Students: Bringing humour into the classroom can transform the learning environment into a lively and effective space, easing tension and encouraging active participation. It cultivates a welcoming atmosphere where students feel at ease and motivated to engage in discussions and activities. Teachers believe that humour strengthens the bond between students and educators, enhancing the enjoyment and accessibility of learning.
- School Administrators: This research highlights the interconnectedness of education, emphasizing the significance of collaboration and integration across various subjects and teaching methods. Schools should develop comprehensive, long-term strategies to tackle challenges and enhance teaching practices effectively.
- Teachers: Teachers help in nurturing students' comprehension and mastery of subject matter, particularly in Mathematics. They must possess diverse pedagogical skills, including the effective use of humour in the classroom. Teacher training programs should prioritize the development of these skills, preparing educators for the complexities of student learning.
- Future Teachers: Pre-service teachers should receive training in pedagogical approaches that incorporate humour, ensuring they can create engaging and effective learning environments. Teacher education programs should be grounded in empirical research and best practices, emphasizing continuous professional development.
- Curriculum Designers: Curriculum design plays a crucial role in promoting deep student learning and comprehension. It should prioritize the acquisition of subject matter knowledge through a deeper understanding, moving beyond mere syllabus coverage to emphasize conceptual learning. This necessitates a shift in the educational paradigm, highlighting the importance of innovative teaching strategies and student-centered pedagogies.

04-IJTETV4I227_p37-45.indd 43 10-07-2024 18:15:50

Conclusion

The study of instructional humor in mathematics education demonstrates its potential for effectively teaching key ideas and improving problem-solving abilities. Teachers highlight the significance of using proper resources and tactics while maintaining relevance and a positive attitude in order to maximize educational gains. Despite students' general acceptance for humour in the classroom, vigilance is suggested to avoid distractions. The attempts to study and refute mathematical myths uncover prevalent misunderstandings that impede students' interest and knowledge of Mathematics. These findings emphasize the need of addressing misunderstandings and promoting good teaching approaches in order to improve mathematics learning outcomes. Humour is an effective strategy for creating teacher-student connection, relevance, and academic performance, emphasizing the necessity of a dynamic interaction between students' perceptions, teaching environment, and views about the subject. By prioritizing positive and inclusive humour, educators can create engaging and supportive learning environments conducive to student success. Through these efforts, educators can enhance mathematical learning experiences and cultivate a more positive and effective educational landscape.

References

Atkinson, C. (2006). *What's so funny?: Or, why humor should matter to philosophers*. Philosophy Today, 50, 437-443.

Bryant, J.A., & Zillmann, D. (1989). *Chapter 2: Using Humor to Promote Learning in the Classroom.* Journal of children in contemporary society, 20, 49-78.

Bishara, S. (2022). *Humour, motivation and achievements in Mathematics in students with learning disabilities*. Cogent Education, 10(1). https://doi.org/10.1080/2331186x.2022.2162694

Civikly, J.M. (1986*). Humor and the Enjoyment of College Teaching.* New Directions for Teaching and Learning, 1986, 61-70.

Ellingson, L.L. (2018). *Pedagogy of Laughter: Using Humor to Make Teaching and Learning More Fun and Effective.* In Springer eBooks (pp. 123–134). https://doi.org/10.1007/978-981-10-6725-9_8

Garner, R. L. (2019*). Humour in Pedagogy: How Ha-Ha Can Lead to Aha!* College Teaching, 43(4), 124-130.

Gorham, J., & Christophel, D.M. (1990). *The Relationship of Teachers' Use of Humor in the Classroom to Immediacy and Student Learning*. Communication Education, 39, 46-62.

Harrison, N. (1995). *Using humour as an educational technique*. Professional nurse, 113, 198-9.

Hackathorn, J.M., Garczynski, A.M., Blankmeyer, K., Tennial, R.D., & Solomon, E.D. (2011). *All Kidding Aside: Humor Increases Learning at Knowledge and Comprehension Levels.* Journal of the Scholarship of Teaching and Learning, 11, 116-123.

Korobkin, D. (1988). *Humor in the Classroom: Considerations and Strategies*. College Teaching, 36, 154-158.

Lamminpaa, J., & Vesterinen, V. (2018). *The use of humour during a collaborative inquiry*. International Journal of Science Education, 40, 1718 - 1735.

Masek, A., Hashim, S., & Ismail, A. (2018). *Integration of the humour approach with student's engagement in teaching and learning sessions.* Journal of Education for Teaching, 45, 228 - 233.

Matarazzo, K.L., Durik, A.M., & Delaney, M.L. (2010). *The effect of humorous instructional materials on interest in a math task*. Motivation and Emotion, 34, 293-305.

Menezes, L. & Gomes, H. (2019). *Humor in mathematics teaching: tasks for the classroom* (2nd edition).https://www.researchgate.net/publication/339213921_Humor_in_mathematics_teaching_tasks_for_the_classroom_2nd_edition.

Morreall, J.S., & Mankoff, R. (2009*). Comic Relief: A Comprehensive Philosophy of Humor by morreall, john.* 68(3), 305–308. https://doi.org/10.1111/j.1540-6245.2010.01423_3.x

04-IJTETV4I227_p37-45.indd 44 10-07-2024 18:15:50

Powell, J.R., & Andresen, L.W. (1985). *Humour and teaching in higher education*. Studies in Higher Education, 10, 79-90.

Scheel, T., & Gockel, C. (2017). *Humor at work in teams, leadership, negotiations, learning and health.* Springer Science + Business Media. https://doi.org/10.1007/978-3-319-65691-5

Shmakov, P., & Hannula, M.S. (2010). *Humour as Means to make Mathematics Enjoyable.* Proceedings of CERME 6, 6.

Smith, J. (2018). *Self-Directed Learning in Mathematics: A Comprehensive Review*. Educational Studies in Mathematics, 45(2), 235-253.

Walshaw, M., & Anthony, G. (2008). *The Teacher's Role in Classroom Discourse: A Review of Recent Research Into Mathematics Classrooms*. Review of Educational Research, 78, 516 - 551.

Warwick, J. (2009). *An Experiment Relating Humor to Student Attainment in Mathematics*. PRIMUS, 19, 329 - 345.

04-IJTETV4I227_p37-45.indd 45 10-07-2024 18:15:50