



Benefits Of Online Puzzles for Teaching Mathematics at Higher Secondary Level

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ABSTRACT

There are many benefits of using online puzzles in higher secondary education. Students' cognitive ability, logical reasoning, and problem-solving skills are all improved by these interactive resources. Students can tackle difficult topics from a variety of angles by solving online puzzles, which foster critical thinking, creativity, and analytical reasoning. Additionally, they encourage healthy competitiveness, motivation, and engagement, which enhance the effectiveness and enjoyment of learning. The investigator has followed random sampling method for the present study. The investigator has collected a sample of 250 higher secondary teachers working in Madurai. Teachers may establish a more dynamic, student-centered learning environment that accommodates a range of learning needs and styles by integrating online puzzles into their lesson plans. This strategy may result in better academic achievement, higher levels of student satisfaction, and a more pleasurable educational process.

Keywords: Online Puzzles, Mathematics Education, Higher Secondary Level, Educational Technology, Teaching Methods.

NEED FOR STUDY

As students move from core learning to increasingly complicated and specialized areas, the upper secondary level is a crucial time in their academic careers. Students get disinterested and unmotivated when traditional teaching approaches fail to engage them and encourage deeper study. Although online puzzles present a tempting answer, little is known about how well they can instruct upper secondary students. In order to help teachers design more interesting and successful learning environments, this study intends to explore the advantages of online puzzles in improving higher secondary students' critical thinking, problem-solving, and cognitive skills.

TERMS AND DEFINITION

Benefits: it refers to the positive effects, advantages, or improvements that something provides.

Online puzzles: it refers a game or problem solving activity that can be played digitally.

Teaching: it refers transferring information, abilities or moral principles to others.

Mathematics: the abstract study of numbers quantities, forms and patterns as well as their interactions and characteristics is referred to us.

Higher Secondary Level: it usually includes the last year of secondary school, which depending on the national educational system, may include grade 11/12 or their equivalent.

OBJECTIVES OF THE STUDY

1. To find out the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level.
2. To find out the significant difference in the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of

- ✓ Gender
- ✓ Qualification

HYPOTHESIS OF THE STUDY

1. The level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level is average.
2. There is no significant difference in the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of
 - ✓ Gender
 - ✓ Qualification

INSTRUMENTATION

The investigator developed and validated a rating scale on 'Benefits of online puzzles for teaching mathematics at higher secondary level. The ratings were Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree.

ESTABLISHING VALIDITY OF THE TOOL

In order to establish the validity of the prepared tool, the investigator submitted the draft tool to the experts in the field of technology and higher secondary mathematics teachers for suggestions and modifications. After studying the draft tool the experts gave some suggestion to modify certain items. The investigator carried out those changes in the draft tool and established the validity of the tool prepared.

ESTABLISHING RELIABILITY OF THE TOOL

TEST – RETEST METHOD

The tool was administered among 50 higher secondary mathematics teachers. After a gap of 30 days the test was re-administered among the same 50 higher secondary teachers. Pearson's product moment correlation was applied to the scores. The correlation value out was 0.92. It is a high level of correlation. Thus, the reliability of the tool was ensured

SCORING

The tool is having 35 items. Five response categories are: Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree. The tool of 5 is given to each 'Strongly Agree' response, 4 is given to each 'Agree' response, 3 is given to each 'Neutral' response, 2 is given to each 'Disagree' response and 1 is given to each 'Strongly Disagree' response for all the statements. The maximum mark will be 175.

SAMPLE DESIGN

The investigator has followed random sampling method for the present study. The investigator has collected a sample of 250 higher secondary teachers working in Madurai District.

ANALYSIS

HYPOTHESIS 1

The level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level is average.

TABLE 1 : DESCRIPTIVE ANALYSIS ON BENEFITS OF ONLINE PUZZLES FOR TEACHING MATHEMATICS AMONG TEACHERS AT HIGHER SECONDARY LEVEL

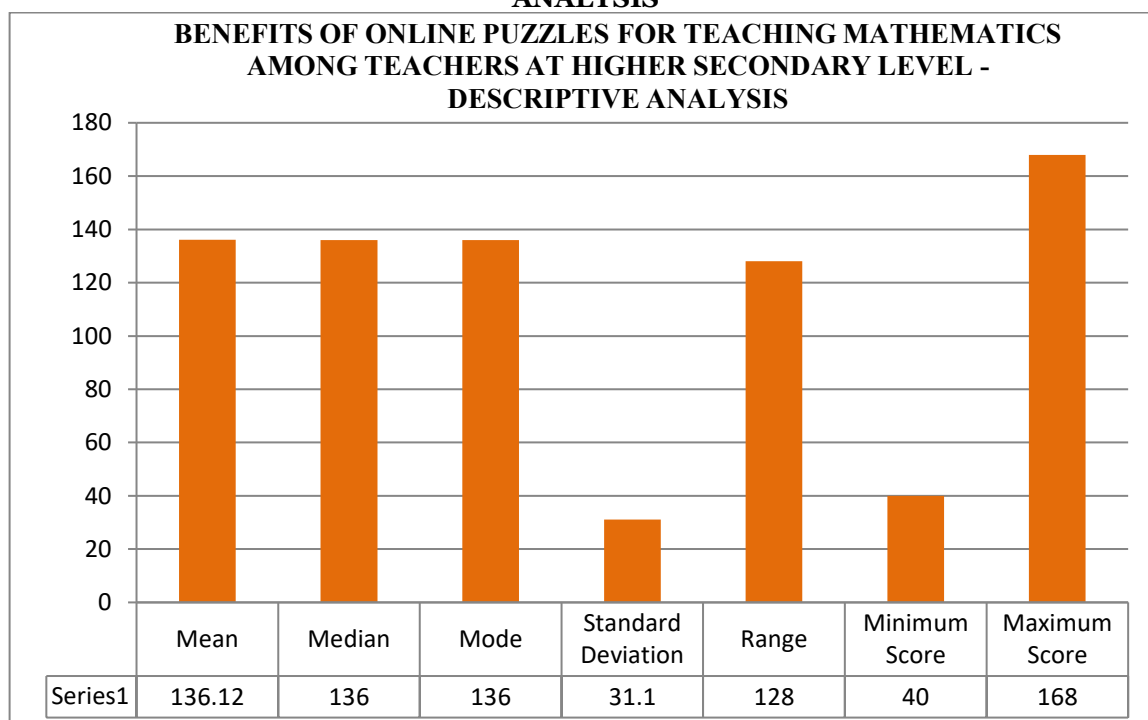
S.No	Description	Benefits of Online Puzzles
1	N	250
2	Mean	136.12
3	Median	136
4	Mode	136
5	Standard Deviation	31.10
6	Range	128
7	Minimum Score	40
8	Maximum Score	168
9	Theoretical Mean	84

It is evident from Table 4.3 that the median and mode values for benefits of online puzzles for teaching mathematics among teachers at higher secondary level are 136 and 136 respectively. The highest score is 169

and the lowest score is 70. The mean value obtained is 136.12 with standard deviation of 31.10. It is well above the theoretical mean of 84. It is proved from the above table that the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level is high. So, the hypothesis stated as "The level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level is average" is rejected.

It may be concluded from the above that the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level is high.

FIGURE 1 BAR DIAGRAM SHOWING BENEFITS OF ONLINE PUZZLES FOR TEACHING MATHEMATICS AMONG TEACHERS AT HIGHER SECONDARY LEVEL - DESCRIPTIVE ANALYSIS



HYPOTHESIS 2

There is no significant difference in the benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of Gender

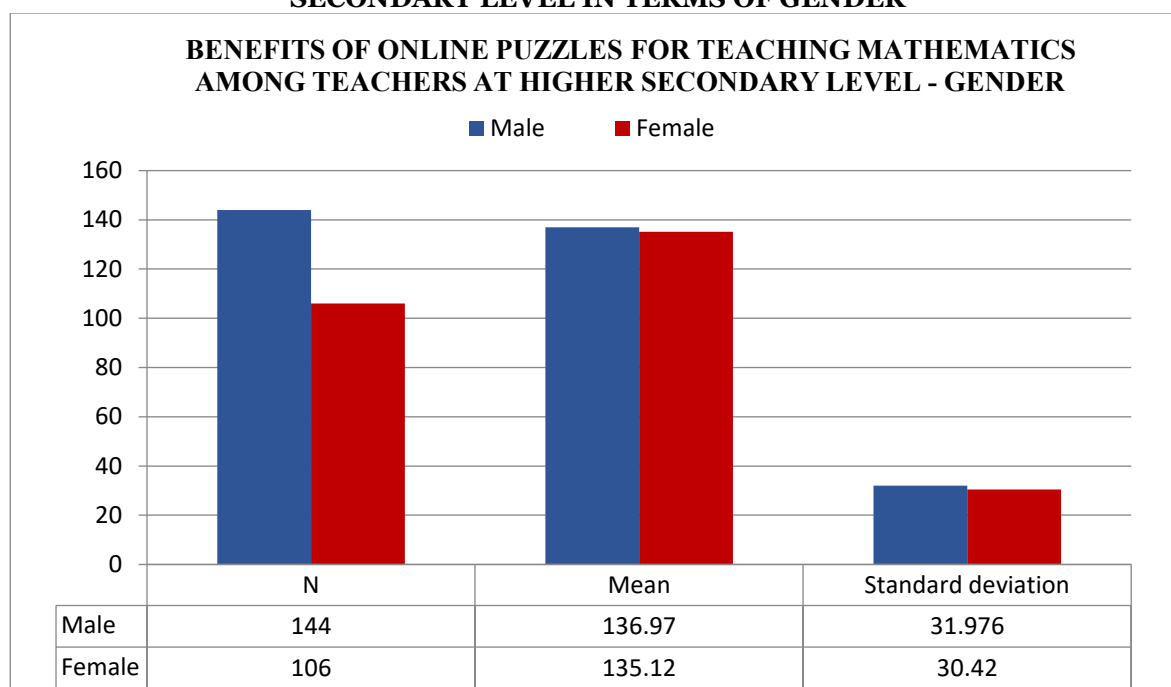
TABLE 2: MEAN, S.D. AND 't' VALUE FOR BENEFITS OF ONLINE PUZZLES FOR TEACHING MATHEMATICS AMONG TEACHERS AT HIGHER SECONDARY LEVEL IN TERMS OF GENDER

Gender	N	Mean	Standard deviation	Calculated 't' value	Table 't' value at 5% level	Remarks
Male	144	136.97	31.976	1.425	1.980	Not Significant
Female	106	135.12	30.420			

It is evident from Table 2 that the obtained 't' value is 1.425. It is lower than the critical value of 1.980. It is not significant. Hence the hypotheses stated as 'There is no significant difference in the benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of Gender' is accepted. The mean value of female higher secondary teachers' benefits of online puzzles for teaching mathematics is 135.12. It is lower than the mean value of male higher secondary teachers' benefits of online puzzles for teaching mathematics that is 136.97. It is inferred from the above that the male higher secondary teachers' benefits of online puzzles are better compared to female teachers' benefits of online puzzles for teaching mathematics at higher secondary level.

It may be concluded from the above table that there is no significant difference in the benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of gender. It is inferred from the findings that both male and female teachers are equal in the benefits of online puzzles for teaching mathematics among teachers at higher secondary level.

FIGURE 2 BAR DIAGRAM SHOWING THE SIGNIFICANT DIFFERENCE FOR BENEFITS OF ONLINE PUZZLES FOR TEACHING MATHEMATICS AMONG TEACHERS AT HIGHER SECONDARY LEVEL IN TERMS OF GENDER



HYPOTHESIS 3

There is no significant difference in the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of Qualification

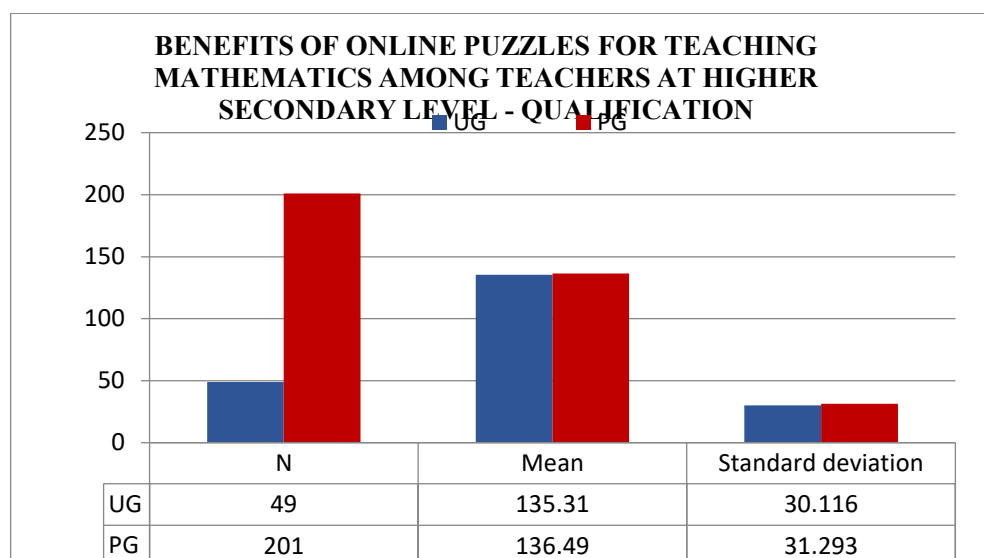
TABLE 3 MEAN, S.D. AND 't' VALUE FOR BENEFITS OF ONLINE PUZZLES FOR TEACHING MATHEMATICS AMONG TEACHERS AT HIGHER SECONDARY LEVEL IN TERMS OF QUALIFICATION

Qualification	N	Mean	Standard deviation	Calculated 't' value	Table 't' value at 5% level	Remarks
UG	49	135.31	30.116	0.282	1.980	Not Significant
PG	201	136.49	31.293			

It is evident from Table 3 that the obtained 't' value is 0.282. It is lower than the critical value of 1.980. It is not significant. Hence the hypotheses stated as 'There is no significant difference in the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of Qualification' is accepted. The mean value of teachers having qualification as UG on benefits of online puzzles for teaching mathematics is 135.31. It is lower than the mean value of teachers having qualification as PG on benefits of online puzzles for teaching mathematics that is 136.49. It is inferred from the above that the teachers having qualification as UG on benefits of online puzzles for teaching mathematics is better compared to teachers having qualification as PG.

It may be concluded from the above table that there is no significant difference in the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of qualification. The level of benefits of online puzzles for teaching mathematics among the teachers having qualification as UG and the teachers having qualification as PG are equal.

FIGURE 4.13 BAR DIAGRAM SHOWING THE SIGNIFICANT DIFFERENCE FOR BENEFITS OF ONLINE PUZZLES FOR TEACHING MATHEMATICS AMONG TEACHERS AT HIGHER SECONDARY LEVEL IN TERMS OF QUALIFICATION



FINDINGS OF THE STUDY

1. There is no significant difference in the benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of gender. It is inferred from the findings that both male and female teachers are equal in the benefits of online puzzles for teaching mathematics among teachers at higher secondary level.
2. There is no significant difference in the level of benefits of online puzzles for teaching mathematics among teachers at higher secondary level in terms of qualification. The level of benefits of online puzzles for teaching mathematics among the teachers having qualification as UG and the teachers having qualification as PG are equal.

CONCLUSION

The results of the study showed that there were major advantages to using online puzzles in higher secondary education. Students' critical thinking, problem-solving, and cognitive capabilities all significantly improved. Their logical thinking, creativity, and analytical reasoning were all improved by the puzzles, which improved their academic achievement. Overall, the results indicate the effectiveness of online puzzles as a teaching tool for higher school pupils, encouraging deeper learning, better academic performance, and higher levels of student satisfaction.

EDUCATIONAL IMPLICATIONS

Online puzzles are another tool that educators may utilize to support equity and inclusivity by accommodating a range of learning requirements, styles, and skill levels. Additionally, online puzzles can be utilized to provide data-driven training, evaluate student learning, and pinpoint areas for development. By using online puzzles, teachers can improve academic achievement, motivation, and student engagement—all of which will raise the standard of instruction at the upper secondary level.

BIBLIOGRAPHY

1. Bofferding, L., & Aqazade, M. (2023). "Where does the square go?": reinterpreting shapes when solving a tangram puzzle. *Educational Studies in Mathematics*, 112(1), 25-47.
2. Farnell, E. (2017). Puzzle pedagogy: A use of riddles in mathematics education. *Primus*, 27(2), 202-211.

WEB REFERENCES

1. <https://www.tandfonline.com/doi/full/10.11120/ened.2013.00005>
2. <https://www.prodigygame.com/main-en/blog/game-based-learning>