



Comparison of Traditional Method, Web Based Learning And Gamification on Achievement of Senior Secondary School Students

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Abstract:

Gamification is new trend in the field of educational technology. This paper analyses the trend of achievement of primary students when they are taught with traditional method, web-based instructions and a combination of the web-based instruction and gamification of those web-based instructions. For these three groups were made and the first group is taught with traditional lecture method, the second group is taught with web-based instructions and the third group was taught with the combination of traditional lecture method and gamification of those instructions. Each group contains 20 students. Purposive random sampling was used. the total sample size is of 60 students of primary classes. Finding shows that there is a sharp increase in the trend of achievement when they are taught with the combination of traditional lecture method and gamification of those instructions.

Introduction:

Nowadays the children struggle with being bored at school. The reason for this might vary from children to children. Some students say that classes are monotonous, and they are very ineffective and there are lots of unimaginative things. The reason for this may be due to the teachers are really in expert or maybe the children do not wish to study. The students are not being sufficiently challenged they have a learning difference or mentally health conditions or they are simply not motivated by the subject matter it could just be that it is hard for them to sit through so much this time. So, the time needs an introduction of fun to the teaching. Children love games in any form. Not even children but elders also enjoy games. And if the studies are mixed with games, then it makes environment light and helpful in learning. Adding games to the teaching is gamification. Gamification is adding game mechanics into nongame environments, like a website, online community, learning management system or business' intranet to increase participation. Game design elements that can be used in education are like this:

1. Points:

The point system functions as a measure of success or achievement. These points may be used as rewards, as a form of investment for

further progression towards the goals, or to indicate one is standing. There are different types of points, and they vary across games. For example, Experience Points (XP) (i.e., points earned by completing tasks) and Steam Points (i.e., points that correspond to in-game currency) were used for some of the role-playing games in education. Points can also be considered as credits in an academic environment.

2. Levels/Stages:

The level system is used in various game designs to give players a sense of progression in the game. Initial levels tend to require less effort and are quicker to achieve, whereas the advanced levels require more effort and skills. Even though levels/stages are a widespread and popular gamification concept, and they serve as a form of rewards for task or assignment completion, students' learning abilities may not progress or improve because of levelling.

3. Badges:

Badges are recognized as a mark of appreciation or task accomplishment during the process of goal achievement. To maintain learners' motivation, the use of badges is helpful for engaging the learners in subsequent learning tasks. Badges are effective in inspiring learners to work towards future goals. Most of the student

respondents in Santos et al.'s survey also felt that badges helped to keep them engaged, especially in the classroom context, and motivate them to carry out future learning tasks.

4. Leader boards:

The objective of a leader board is to keep the learners motivated and create a sense of eagerness to advance their names for the achievements they have accomplished. Leader boards are used to create a competitive environment among students. A leader board is used to display the current levels of high scorers and the overall scores. To avoid demotivation for those who are lower ranked, leader boards usually display the top 5 or 10 scorers only. The survey findings by O'Donovan et al. suggest that leader boards rank highest in motivating learners.

5. Prizes and Rewards:

The use of prizes has been found to be effective in motivating learner. The timing and scale of rewards can also affect learner motivation. In general, it is better to give multiple small rewards than one big reward. Also, the schedule for giving out rewards should be evenly distributed throughout the learning process. An example of in-game rewards is character upgrades. A character upgrade is a way to motivate learners by displaying their progress in the form of characters. It allows others to recognize the amount of effort a learner has spent to reach his or her current level. To use character upgrades as a game design element, one must be given a virtual character which allows him or her to upgrade from time-to-time by means of the points or rewards earned.

6. Progress bars:

Several researchers have utilized progress bars to gamify education. While badges demonstrate achievements towards a particular level/goal, progress bars are used to track and display the overall goal progression. In an educational game, progress bars are used as a display mechanism to motivate people who are close to achieving their educational goal or sub-goals. Progress bars can also encourage them if they are falling behind in their progress.

7. Storyline:

Storyline refers to the narrative or story in the game. Kapp suggests that a good storyline can help learners to achieve an ideal interest curve, where interest peaks

around the beginning and end of the learning process, and to stay motivated throughout the learning process. A storyline also provides a context for learning and problem solving as well as helps to illustrate the applicability of concepts to real-life.

8. Feedback:

The frequency, intensity, and immediacy of feedback are helpful for learner engagement. The more frequent and immediate the feedback is, the greater the learning effectiveness and learner engagement. Clear and immediate feedback has been shown to be important for attaining the flow state, which is a state of engagement and immersion in an activity. Hence, feedback is an important criterion for performance and engagement.

This Make the environment fun filled, light and stress free so that the students or the consumer or customer or anyone can choose purchase or learn anything without any stress.

The gamification of learning is an educational approach that seeks to motivate students by using video game design and game elements in learning environments. The goal is to maximize enjoyment and engagement by capturing the interest of learners and inspiring them to continue learning. Gamification, broadly defined, is the process of defining the elements which comprise games, make those games fun, and motivate players to continue playing, then using those same elements in a non-game context to influence behaviour. In other words, gamification is the introduction of game elements into a traditionally non-game situation. Smiderle *et.al.* (2020) found the effect of gamification depends on the specific characteristics of users and studied the impact of gamification on learning and engagement based on personality traits of students

Dicheva (2017) found gamification of education is a strategy for increasing engagement by incorporating game elements into an educational environmental Fardo (2014) stated that the goal is to generate levels of involvement equal to what games can usually produce. Christy and fox 2014 found that ranking affects women in various ways. Antonio F., *et.al* (2021) studied gamification as online teaching strategy during COVID 19 found that gamification can be implemented together with traditional lectures and can be a valuable instrument

during the post COVID Times Johnson *et.al.* (2020) found almost all teaching has quickly transitioned to distance education to provide appropriate social distancing.

Above scenario reflects that a very few studies have been conducted comparing the traditional methods with Gamification of study material.

Thus, there was a gap, requiring further studies in this area. Keeping this in mind the researcher decided to undertake the present study.

Statement Of Problem

The problem was worded as given below:

Comparison of Traditional method, web-based learning and gamification on achievement of senior secondary school student

Objective:

The objective of the study was:

1. Effect of Methods of Teaching on the mean scores of achievements of senior secondary school students

Hypothesis:

The objective of the study was:

1. There is no effect of Methods of Teaching on the mean scores of achievements of senior secondary school students

Methodology:

1. SAMPLE:

The sample of the research comprised of 60 class IXth students belonging to a Private school of Indore city. The sample was selected using Stratified Purposive Sampling Technique.

2. TYPE OF RESEARCH

Present study is an Experimental Study, in which, three groups were taken for research work. For this, three groups were made, and the first group is taught with traditional

lecture method, the second group is taught with web-based instructions and the third group was taught with the combination of traditional lecture method and gamification of those instructions. Each group contains 20 students.

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3. Tools

The data was collected in respect of Achievement in Science with the help of Achievement test made by the researcher.

4. Procedure Of Data Collection

First, the permission from the principals of Gyanodaya school was taken and the students were briefed about the objectives of the study and a rapport was established with the students. The students were made aware about the procedure of teaching through all the methods and taking exam, time of tests and day and date of tests. On completion of the test, the booklets and copies were collected back. The collection of data from a single group took about four weeks. The entire data collection process was completed within 25 working days. The collected data were analysed with the help of appropriate statistical technique(s).

ANALYSIS:

Influence of Methods of Teaching on Mean Achievement scores of science

The objective was to study the influence of Methods of Teaching on Mean Achievement scores of science. The Methods of the students was categorized into three levels namely, Traditional Method of teaching, Web based learning and Gamification of topic. Since method has three levels, the data were analysed with the help of one way ANOVA. The results are given in table 1.

Table 1

Summary of One Way ANOVA test of Academic Stress of students of different levels of Intelligence

1. Summary of Data				
	<i>Treatments</i>			
	1	2	3	Total
N	20	20	20	60

ΣX	532	771	862	2165
Mean	26.6	38.55	43.1	36.083
ΣX^2	15074	30319	37510	82903
Std.Dev.	6.9691	5.6052	4.3395	9.0034
Result Details				
<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	
treatment	2905.0333	2	1452.5167	$F = 44.09654$
Error	1877.55	57	32.9395	
Total	4782.5833	59		

**Significant at 0.01 level of significance

From table, it can be seen that the F-value is 44.09654, which is significant at 0.01 level of significance with $df=2,57$. It indicates that the mean scores of Achievement in Science of Traditional Method group, Web-based instruction group and Gamification method group differ significantly. In the light of this, **POST HOC TUKEY HSD (BETA)**

the null hypothesis that “There is no significant difference in mean scores of Achievement in Science of Traditional Method group, Web-based instruction group and Gamification method group” is rejected. Hence, Post Hoc Test is conducted to see where the difference occurs.

<i>Pairwise Comparisons</i>		HSD _{.05} = 4.3675 HSD _{.01} = 5.5068	Q _{.05} = 3.4032 Q _{.01} = 4.2910
T₁:T₂	M ₁ = 26.60 M ₂ = 38.55	11.95	$Q = 9.31$ ($p = .00000$)
T₁:T₃	M ₁ = 26.60 M ₃ = 43.10	16.50	$Q = 12.86$ ($p = .00000$)
T₂:T₃	M ₂ = 38.55 M ₃ = 43.10	4.55	$Q = 3.55$ ($p = .03936$)

Further, the HSD score of achievement in Science of Traditional Method group and Web-Based instructional Method Group is 9.31, which is significant at 0.01 level of

significance. Further, the mean score of Traditional Method group is 26.60 which is significantly lower than the mean score of Web -Based instructional Method Group

38.55. Hence, Web -Based instructional Method Group performed better in science. Further, the HSD score of achievement in Science of Traditional Method Group and Gamification Method Group is 12.86, which is significant at 0.01 level of significance. Further, the mean score of Traditional Method group is 26.60 which is significantly lower than the mean score of Gamification Method Group 43.10. Hence, Gamification Method Group performed better in science.

Further, the HSD score of achievement in Science of Gamification Method Group and Web -Based instructional Method Group is 3.55, which is significant at 0.05 level of significance. Further, the mean score of Gamification Method group is 43.10 which is significantly higher than the mean score of Web -Based instructional Method Group which is 38.55. Hence, Gamification Method Group performed better in science than Web -Based instructional Method Group.

It reflects that the treatment of Gamification of Instructional Material was found to be significantly superior to the Web -Based Instruction and Traditional Method of teaching Science. It may, therefore be concluded that Gamification of Instructional Material Method was found to be superior to Web -Based Instruction and Traditional Method in facilitating Achievement in science of students.

Conclusion:

This study demonstrates some pedagogical implications of gamification by showcasing the academic test result of class ixth students. The program underlines the importance of facilitators in the classroom, where they let students become active learners once they click the button and enter the realm of edutainment. The program can transform the classroom spoon-feeding pedagogy into active learning pedagogy instructed by the program. Acting as

facilitators, teachers can monitor the student progress on their result card and can focus more on the student performance. Moreover, the reward and ranking system can draw the best ability of the students as they can see that the outcome would impact the number of coins that can be used for new items. Gamification could play a vital role in Science education where the following issues are of concern, including the inadequate number of Science teachers, the lack of access to reliable Science materials, and the passivity of the local students. It can be seen from the findings, the students become more participatory and developed better attitudes towards Science lessons, which would be the essence of Teaching.

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