

# Teaching Finance through Storytelling: Impact on Students' Learning

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The use of storytelling for instruction has been advocated for long. But whether the use of a story during a lecture actually results in an improvement in students' learning? This article tries to find an answer to the question by using a story titled "Demons' Treasure" for teaching the topic of "Expected Return and Risk on Investments". The study is based on a sample of 47 students who were divided randomly into a control group (which was taught without the use of story) and an experimental group (which was taught with the use of story). Students' learning was assessed through a subject based quiz. It was found that the use of story did not bring any significant change in quiz scores of the two groups but it did make the lecture interesting and brought other desired outcomes that may be considered essential for making their learning wholesome.

Keywords: storytelling; teaching finance; wholesome learning; students' engagement; human values.

## Introduction

Stories have been used to communicate ideas since times immemorial. Societies that did not have a written language used storytelling as the only means to convey their culture, values and history (Egan, 1989). Story performance honed our mythologies long before they were written and edited by scribes, poets, or scholars (Mello, 2001).

### *Storytelling in teaching*

Egan (1995, 1999) defines storytelling as a linguistic activity which is educative and allows individuals to share their personal understanding with others. Doecke (2015) has reflected on the ways that stories shape our everyday lives; how the meaning-making potential of storytelling enables us to gain insights into our work as educators and concluded that stories are not simply a form of knowing but a vital means of making the world human to us. According to Geanellos (1996), storytelling as a teaching-learning technique "engages learners, organises information, allows exploration of shared lived experience without the demands, responsibilities and consequences of practice, facilitates remembering, enhances discussion, problem posing and problem solving".

Although psychologists and researchers in education have been advocating the use of story-telling in the past, its use in actual teaching-learning process is part of a relatively "recent trend of evidence-based educational practices" (Thuna & Szurmak, 2019). Short and Ketchen (2005) have highlighted the use of classic literature, especially Aesop's fables, for teaching strategic management. They have emphasised that undergraduate students do not have experience of working at top management levels in an organisation and therefore they find it difficult to grasp concepts in strategic management. They have concluded that classic literature can be truly helpful in learning strategy and that it can be a useful addition to strategy professors' "teaching toolbox". Gerde and Foster (2008) consider comic books as a modern form of narrative which can be used effectively in the classroom to teach business ethics and social issues in management. According to Marques, Dhiman and Biberman (2014), a few subjects like spirituality and meditation in management education can be taught only through storytelling and not through the traditional teaching approaches like reading and lecture. Al-Mansour and Al-Shorman (2011) tried to investigate the effect of teacher's storytelling on English language reading comprehension of university students and found that the experiment group ( $n=20$ ,  $M=28.40$ ,  $SD=1.64$ ) performed significantly better than the control group ( $n=20$ ,  $M=24.95$ ,  $SD=2.25$ ). The reported means and standard deviations amount to an effect size of 1.75.

According to Fraser (2007), classroom stories could also address sensitive issues of faith, beliefs and culture and teachers' narratives illustrate ways in which inclusive communities can be fostered. Sunwolf

(1999) has argued that culture affects pedagogy and has offered a descriptive analysis of the effects of three types of learning stories across three separate culture traditions, that is, Native American lesson stories, Sufi Wisdom tales and African dilemma tales. Nguyen, *et al* (2016) tried to find whether there were significant differences between cultural groups on storytelling, resilience and values. An independent sample t-test of mean scores indicated that western college students ( $n=276$  with  $M=3.14$  and  $SD=0.59$ ) tended to have more storytelling childhood experiences than did the Easterners ( $n=569$  with  $M=2.80$  and  $SD=0.58$ ). They concluded that “college students of Western countries who reported having significant childhood experiences of storytelling preferred openness to change values such as Benevolence, Self-direction, and Stimulation”. The reported means and standard deviations amount to an effect size of 0.58.

Though the use of stories has been advocated in many studies for teaching different subjects, the impact of using the art of storytelling for teaching the subject of finance has not been explored much yet. The present study aims to measure the impact of the use of a story on students’ learning in a classroom setting for teaching finance.

### *Instructional methods*

Andrews, Hull and Donahue (2009) have identified four instructional methods related to storytelling, that is, case-based, narrative-based, scenario-based, and problem-based instruction. The problem and the solution are fixed in case-based, narrative based and scenario based instruction as compared to the problem based instruction in which the problem is unstructured with no definite solution. In case-based instruction, a learner observes the given story as an outsider (Barnes, Christensen & Hansen, 1994) whereas in narrative-based instruction, a learner is positioned within the storyteller’s context (Cobley, 2001). In scenario-based instruction, a learner can reach the solution through various possible paths in an interactive way (Salas *et al*, 2006). In problem-based instruction, where there is no definite solution, each learner’s solution becomes a part of the collective ideas of the group and each learner is responsible for his/her own solution and learning (Savery, 2006).

The present study is based on the use of a story amounting to scenario based instruction. The story includes a game that can be played by students which makes the lecture interactive. Though the problem and the solution are clearly defined, the result of the game could be different for each student and the various possible results could help them in understanding the solution better. The students learn best when they feel involved in the teaching process and the objective of the present study is based on this premise.

### **Objective of the study**

The objective of the study was to find out whether the use of a story during a lecture for teaching finance in a classroom results in an improvement in students’ learning or not. Specifically, the following null and alternative hypotheses were constructed:

#### Hypothesis 1

H<sub>0</sub>: There is no difference in students’ learning whether a story is used or not.

H<sub>1</sub>: Students’ learning is better with the use of a story.

#### Hypothesis 2

H<sub>0</sub>: Use of a story in a lecture creates no difference in making a lecture interesting.

H<sub>1</sub>: Use of a story in a lecture makes the lecture more interesting.

#### Hypothesis 3

H<sub>0</sub>: Use of a story does not make a difference in the time for which students would remember a topic.

H<sub>1</sub>: Use of a story would help students in remembering the topic for a long time.

#### Hypothesis 4

H<sub>0</sub>: Use of a story makes no difference in students’ level of engagement during a lecture.

H<sub>1</sub>: Use of a story increases students’ level of engagement during a lecture.

#### Hypothesis 5

H<sub>0</sub>: Stories imparting knowledge of a subject make no difference in inculcating human values among students.

H<sub>1</sub>: Stories imparting knowledge of a subject may inculcate human values too.

## Materials and Methods

### Sample

A priori power analysis was done using G\*Power to assess the required sample size. The required sample size was estimated on the basis of a chosen effect size (Cohen's  $d$  for independent samples in a  $t$ -test) of 0.80; a chosen power ( $1-\beta$ , that is the probability of not committing a type II error) of 0.80 and a chosen alpha (that is, the significance level) of 0.05. The required total sample size was computed as 42 and with an allocation ratio of 1, sample size of each of the two independent samples was determined as 21 students.

For the study, a total of 47 students (29 Male and 18 Female) were taken and were divided into two groups randomly. Though the proportion of male and female students could have been more equitable, it could not be done despite efforts; which got consumed in getting a large enough sample. Randomisation was done using random numbers generated between 1 and 47 on a spread sheet using a "randbetween" function. The participating students were arranged serially and then they were allotted to the control group and the experimental group on the basis of random numbers generated.

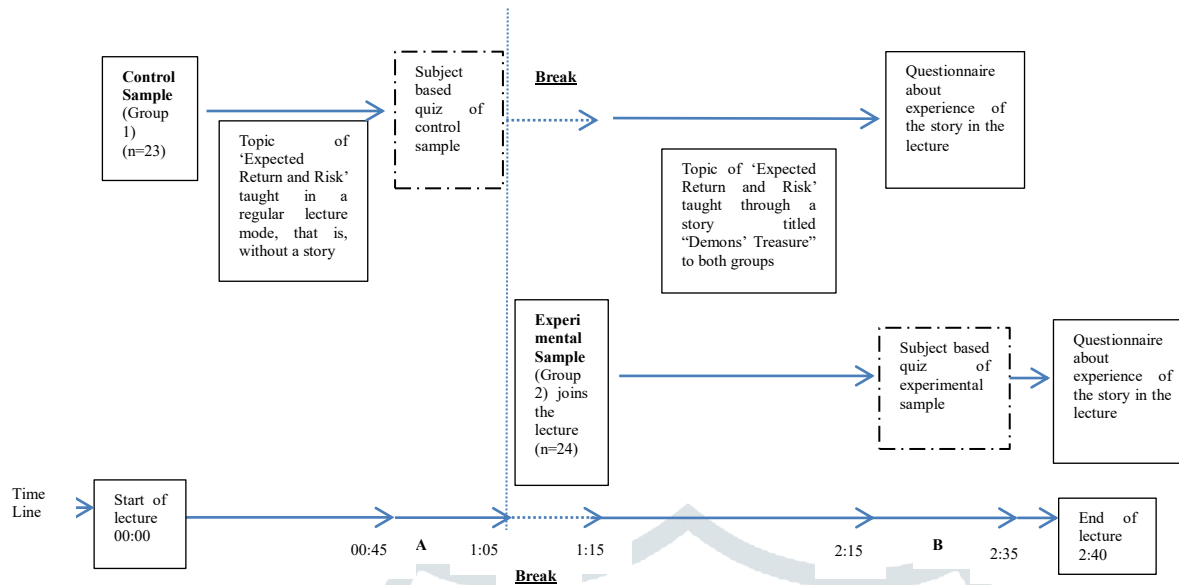
The first group (that is, the control group) consisted of 23 students and the second (that is, the experimental group) consisted of 24 students. All the students were final year undergraduate students in commerce discipline in a college. The capability level of students of both the groups has been assumed at par because all of them have fulfilled the same admission criteria while seeking admission in the college. A notice was given to all students of finance in the final year inviting them to participate in the experiment. Prior consent of all 47 applicants was taken and it was made amply clear to all participants that the experiment was purely for research purpose and that it will not affect their end-term assessment in any way. The students were permitted to leave the experiment at any time they wished so.

### Design of experiment

The experiment was based on two measurement instruments. The first instrument was a subject based quiz and the other, a questionnaire about the experience of the use of story in the lecture. The first group of students (that is, the control group) was taught a topic in finance through a regular lecture (that is, without using a story) and their assessment was done at its conclusion through the subject based quiz. After that, the second group of students (that is, the experimental group) joined the first group and the same topic was taught to both the groups together through a story. At the end of the story, the experimental group was assessed on the same quiz as was given to the control group. While the experimental group was answering the quiz, the control group was asked to fill in a questionnaire about their experience of the use of story in the lecture; after which, the students of control group were free to leave the lecture hall. The students of experimental group, after responding to the quiz, were also asked to fill in the said questionnaire, leading to the conclusion of the experiment. The design of the experiment has been illustrated on a time line in figure 1.

The control group attempted the subject based quiz at point A on time line whereas the experimental group attempted the quiz at point B on the time line. The responses to the subject based quiz of the control group and of the experimental group were compared to assess whether use of story-telling in the lecture had an impact on students' learning or not. Since the two groups are independent samples with a size of less than 30 students each and unknown population standard deviations, a  $t$ -test (right-tailed) for differences between means of independent samples has been used (Levin & Rubin, 1996, p.384) for analysis of quiz scores of the control group and the experimental group (corresponding to Hypothesis 1).

The control group continued to attend the lecture beyond point A on timeline and studied the topic with the use of story too; along with the experimental group. However, the control group was not asked to attempt the subject based quiz again at point B on timeline. Doing so would have caused a repeated measure, which was not intended for the purpose of present study. Because the control group learnt the topic with the story too, it may be called as a "Treated Control Group" beyond the break on the timeline. The questionnaires about the experience of learning through story were filled by the treated control group as well as the experimental group towards the end of the experiment.



**Figure 1: Design of the Experiment**

The responses to the questionnaires of both the groups collectively were considered as a single sample for the purpose of testing whether the impact of storytelling was significant enough for its applicability in general (corresponding to Hypothesis 2,3,4, and 5). A one tailed z-test of means was used for this purpose because even though the population standard deviation is unknown, the combined sample size was more than 30 students (Levin & Rubin, 1996, p.384).

### The story's summary

The story titled "Demon's Treasure" that has been used in the present study was presented by Singhal (2016) for teaching the topic of "Expected Return and Risk".

The story is set in a kingdom whose king was considered more of a saint who used to impose minimum taxes and cared for his subjects warmly. The prosperity and happiness got disrupted by a draught for three years in a row. The king opened the gates of treasury for the people. With time, the treasury depleted and the only recourse available was to do the unthinkable, that is, to fetch a treasure that was guarded by two demons on a mountain just outside the kingdom's boundary. In a turn of events, the responsibility to fetch the treasure was taken up by a young brother and sister.

The siblings had to supposedly fight the demons for the treasure of gold coins but when they reached the mountain, the demons laughed uncontrollably on seeing that such young kids have come for them. The demons thought of having some fun and asked them to play a game instead of a fight. The siblings got surprised but agreed for the game as they had nothing to lose.

The game was based on ten chits mentioning some number of gold coins, five of which were supposed to have a positive number and the other five were supposed to have a negative number. One of the demons prepared two chits carrying a denomination of 1,000,000 coins, three chits carrying 700,000 coins, two chits carrying 400,000 coins and three chits carrying 200,000 coins. The sister pointed out that he had forgotten to put signs on the chits and offered help in doing so. The demon agreed but insisted that five of the chits should have a positive sign and other five should have a negative sign. She cleverly put negative signs on chits with denominations of 400,000 coins and 200,000 coins. The chits and their denominations in the game are given in table 1.



Table 1: Chits in the Game

Number of coins	Number of chits
1,000,000	2
700,000	3
- 400,000	2
- 200,000	3
Total chits	10

The siblings had to draw a chit out of an urn. If number on the chit drawn was positive, they would win those many coins and if the number was negative, they would lose those many coins. A chit was to be drawn ten times in one game to decide the total coins won or lost in a game.

The sister quickly computed the expected winning in the game as 270,000 coins per draw. The students were explained how the expected winning per draw was computed using probabilities based on the number of chits. The brother agreed to play the game and the sister assured him of a sound win; courtesy her wit in preparation of the chits. The expected winning in the game of ten draws was 2,700,000 coins. After playing the game, the chits drawn by him in ten draws are shown in table 2.

Table 2: Chits Drawn in the Game

Number of coins	Number of draws
1,000,000	2
700,000	2
-400,000	4
-200,000	2
Total draws	10

On the basis of chits drawn (as shown in table 2), the brother actually won 1,400,000 gold coins. He asked his sister why his winning (that is, 1,400,000 coins) was lesser than the expected winning of 2,700,000 coins. She explained that the actual winning was bound to differ from the expected winning. The expected winning of 270,000 coins per draw would in fact, never occur because it is not mentioned on any of the chits in the game. In any one draw, either a win of 1,000,000 or 700,000 coins or a loss of 400,000 or 200,000 coins is possible. The expected winning of 270,000 coins per draw simply means that when the game is played for many times (say, thousands of times) then the average of all those winnings would be close to 270,000 coins. A variation in winnings is, therefore, inevitable and this possible variability is a measure of risk involved which can be measured through standard deviation. The standard deviation in the game was computed as 564,003 coins.

At this point, the students were asked to prepare chits and play the game individually in the same way as it was in the story. All the students observed the result of their game and disclosed their final winning of ten draws before the group. While some students reported that they had won more than 2,700,000 coins, others reported that they had won less than 2,700,000 coins and some even reported that they had lost gold coins in the game. The winning/loss of each individual student and the variability in the results among the group were discussed thereafter.

It was explained to students that in case of investments, the number of gold coins would get replaced by estimated return on investment in percentage. The return that an investor might earn in a year is akin to the win/loss in a single draw of a chit. The winning of 1,400,000 coins of the brother in ten draws is akin to a total return over ten years in an investment during which an investor might get a positive return or a negative return in any particular year. Just like in the game, it is possible that an investor might earn a return higher or lower than the expected return over the years. An investor might even suffer a loss on investment even though the expected return was reported to be a handsome positive one; which defines the expected risk involved.

The story continued after the game. The demons couldn't digest their loss and insisted on playing the game once again. However, the demons understood the smartness played by the sister in the first game and decided to change the ten chits to ensure that the chance of winning gold coins got reduced substantially. This time, the sister played the game. Despite the odds, she won the game; though with quite a smaller number of gold coins. The second loss baffled one of the demons and he charged to attack the siblings but the other demon stopped him and insisted on honouring the game as decided.

The siblings collected the treasure and headed for home. On their way back home, they regained their normal self and started arguing about which of the two games that they had played was more risky. The concept of relative risk measured through co-efficient of variation has been explained through their discussion leading to the end of the story.

### Implementation fidelity

Five components are considered essential for assessment of fidelity, i.e., Program Differentiation, Adherence, Quality, Exposure and Responsiveness (Gerstner & Finney, 2013). The specific features of the present experiment that were defined under program differentiation are given in Table 3.

Table 3: Implementation Fidelity

Features	Time planned (in minutes)	Actual time (in minutes)	Number of students planned	Number of students present
Regular lecture for the control group	45	55	23	23
Subject based quiz for the control group	20	20	23	23
Narration of story to the combined group including: Playing the game in the story Applying the game to the world of investments Discussing the winnings of all students in the game	60	70	47	47
Subject based quiz of the experimental group	20	20	24	24
Questionnaire about story's experience by the combined group	5	5	47	43

Since the experiment was conducted by the authors themselves, all the features of the experiment were adhered to. As regards quality, the implementers were as enthusiastic as the students. The program was well organised, made substantially clear to the students and progressed at a comfortable pace for all. As regards exposure, the actual time devoted on various activities was either equal or a bit more than planned, as is reflected in table 3. Ample time was devoted on discussion about the varied winnings of the students. Sufficient time was also devoted to mapping the expected winning of the game and possible deviation therein with the concept of expected return and risk on investments. The actual number of students was the same as planned for all activities except for the questionnaire activity towards the end of the experiment. As regards responsiveness, the control group listened to the regular lecture attentively and students asked their queries which were answered before they attempted their subject based quiz. During the narration of the story, all students had a sparkle in their eyes which is rarely seen in a regular lecture. They played the game with vigour and disclosed their winnings openly before the class. A few students commented that understanding the concept of relative risk in investments (measured by co-efficient of variance) through comparison of the games played by the brother and the sister in the story was particularly interesting. A few other students commented that though learning through the story was interesting, it was more time consuming and that the story could have been divided in two parts and covered in two lectures instead of a single stretched one.

According to Nelson *et al* (2012), determining index reliability is a must while assessing implementation fidelity and the classical approach for that is to employ Cronbach's alpha. For the subject based quiz, which aimed at measuring the learning of students, Cronbach's alpha was computed as 0.74. Also, for the questionnaire, which aimed to know the overall impact of the use of story in the lecture, the Cronbach's alpha was computed as 0.71.

## Results

At conclusion of the story, data generated for the purpose of study comprised of twenty three responses to the subject based quiz of the control group, twenty four responses to the subject based quiz of the experimental group and a total of forty three responses to the questionnaire about students' opinions on the use of story-telling in the lecture. The responses to the questionnaire were forty three instead of forty seven because four students (three from control sample and one from experimental sample) did not fill the said questionnaire.

### *Responses to the subject based quiz*

The subject based quiz had five multiple choice questions that were framed to test the students about their understanding of the concept of expected risk and return. Three of the five questions tested the students' ability to solve a numerical problem (one each on expected return, expected risk and co-efficient of variation) and two questions tested the students' conceptual clarity (one each on expected return and co-efficient of variation).

The proportion of correct answers to the quiz has been taken as a measure of student's learning. If a student has given three correct answers out of five then his/her score would be 60% and for four correct answers, the score would be 80% and likewise. The mean scores, standard deviations, t-statistic for difference between means (assuming equal variance), *p*-value and effect size (Cohen's *d*) of proportion of correct answers of students in the two groups are shown in table 4.

Table 4: Learning Measured through Subject Based Quiz

Measure of learning	Control sample (n=23)		Experimental sample (n=24)		<i>t</i> (45)	<i>P</i>	Cohen's <i>d</i>
	M	SD	M	SD			
Proportion of correct answers in subject based quiz	73.91%	28.56%	71.67%	31.71%	0.254	0.40	0.074

With a *p*-value of 0.40 in table 4, there is not enough evidence to reject the null hypothesis 1 and therefore it may be said that there is no significant difference in students' learning whether a story is used or not in a classroom lecture; where the level of students' learning has been measured in terms of the proportion of correct answers to the subject based quiz.

The Post-hoc power of t-test in table 4 was computed using G\*Power to assess the reliability of the test. With an effect size of 0.074, level of significance ( $\alpha$ ) 0.05 and degrees of freedom 45, the post-hoc power of t-test for difference between means of subject based quiz scores was computed as 0.081.

*Responses to the Questionnaire*

After the subject based quiz, the students' responses to the questionnaires about their opinion on the use of story were analysed. Since the treated control group had studied the topic taught both – with and without the use of story while the experimental group had studied the topic only with the use of story; before the two groups could be treated as a combined single sample, it was assessed whether there was a significant difference between responses of the two groups or not. For this purpose, the treated control group and the experimental group were considered as two independent samples and an independent sample t-test (two-tailed) for differences between means was used (again because sample sizes were less than 30 with unknown population standard deviations).

The responses to the questionnaires of the treated control group and the experimental group along with their means ( $M$ ), standard deviations ( $SD$ ) and number of respondents ( $n$ ) have been summarised in table 5. Responses to questions 1 to 4 in the questionnaire were on a scale from 1 to 5 where 1 refers to “Strongly Disagree”, 2 refers to “Disagree”, 3 refers to “Neutral”, 4 refers to “Agree” and 5 refers to “Strongly Agree”.

Table 5: Comparison of Responses of the Two Groups to the Questionnaire

Questions	Treated control group ( $n=20$ )		Experimental group ( $n=23$ )		$t(41)$	$p$ -value	Cohen's $d$
	$M$	$SD$	$M$	$SD$			
Do you agree that storytelling in classroom has made the lecture much more interesting?	4.70	0.470	4.521	0.845	-0.836	0.203	0.2616
Do you agree that the story will help you in remembering the topic for a much longer time?	4.70	0.571	4.739	0.448	-0.251	0.401	0.0759
Do you agree that your level of engagement in the lecture involving storytelling was much more as compared to any regular lecture?	4.45	0.686	4.391	0.891	0.239	0.406	0.0737
Do you agree that teaching through stories can highlight human values besides explaining the intended topic?	4.75	0.716	4.826	0.387	-0.441	0.330	0.1319

Since the  $p$ -values for independent sample t-test (two-tailed) for differences between means of the treated control group and experimental group with respect to all four questions are sufficiently high in table 5, it may be said that there is no significant difference between responses of students in the two samples. This means that the opinions of students did not differ significantly even though some of them (that is, the students of treated control group) had studied the topic both – with and without the use of story while other students (that is, the students of experimental group) had studied the topic only with the use of story during the lecture.

Thus, for the purpose of testing Hypotheses 2, 3, 4 and 5, the students of both - the treated control group and experimental group were considered together as one sample and the responses to the questionnaires of the combined group along with the test results have been summarised in table 6.



Table 6: Responses to the Questionnaire of the Combined Group

Questions	Responses of combined group <i>n</i> =43	z-value	<i>p</i> -value	Post-hoc Power (1- $\beta$ )
	( <i>M</i> )	( <i>SD</i> )		
Do you agree that storytelling in classroom has made the lecture much more interesting?	4.60	0.48	5.706	<0.01 0.999
Do you agree that the story will help you in remembering the topic for a much longer time?	4.72	0.25	9.387	<0.01 0.999
Do you agree that your level of engagement in the lecture involving storytelling was much more as compared to any regular lecture?	4.42	0.63	3.458	<0.01 0.998
Do you agree that teaching through stories can highlight human values besides explaining the intended topic?	4.79	0.31	9.278	<0.01 0.999

*Note.* A one tailed Z-test of means was used and because population standard deviation is unknown, it was estimated using the sample standard deviation. *p*-values were computed using the “Z.TEST” function in a spread sheet where the value to test had been taken as 4 (because a value of more than 4 would lie between “Agree” and “Strongly agree”). Post-hoc power was computed using Generic Z-test in G\*Power with tails=one,  $\mu=4$ ,  $\alpha=0.05$ .

Since the *p*-values for the Z-test for all the four questions in the questionnaire were less than 0.01, it may be said that the evidence is significant enough to reject the null Hypotheses 2, 3, 4 and 5 which were, “Use of a story in a lecture creates no difference in making a lecture interesting”, “Use of a story does not make a difference in the time for which students would remember a topic”, “Use of a story makes no difference in students’ level of engagement during a lecture” and “Stories imparting knowledge of a subject make no difference in inculcating values among students” respectively.

In the questionnaire, students were also asked about their opinion on specific values that they think were highlighted in the story. Three values were mentioned in the questionnaire and the students could tick against any or all of those three. The values, along with the responses of students of the combined group have been given in table 7.

Table 7: Responses to specific human values by the combined group of students

Values	Out of total 43 responses
Courage and intelligence are not dependent on gender (like the siblings in the story)	Ticked by 28 students (65%)
One should be humble even if one has power and wealth (like the king in the story)	Ticked by 27 students (63%)
Even a herculean task can be accomplished through team work (like fetching the treasure from demons)	Ticked by 30 students (70%)

Although, almost all the students had agreed that a story can highlight human values besides explaining the intended topic, not all of them had ticked against all three specific values. Some students had ticked against only one while some had ticked against two and only a few had ticked against all three specific values. A few others, however, did not tick against any of the specific values. This could be due to

the diverse ways in which students may perceive the story's plot and characters. Despite the natural differences in their perception, a fair proportion of students (that is, between 63% and 70%) have ticked against each of the specific values.

### *Test for outliers*

To test whether there were any outliers in the data, a 1.5 times Inter-Quartile Range (IQR) method was used. IQR is computed as the difference between the third quartile ( $Q_3$ ) and the first quartile ( $Q_1$ ). For the subject based quiz scores,  $Q_3$  and  $Q_1$  were computed as 100% and 60% respectively. Consequently, IQR (i.e.,  $Q_3 - Q_1$ ) was computed as 40%. According to this method, the lower outliers are identified as values less than  $Q_1 - 1.5(IQR)$  and upper outliers are identified as values more than  $Q_3 + 1.5(IQR)$ . In the present data of subject based quiz scores,  $Q_1 - 1.5(IQR)$  was 0% (i.e.,  $60\% - 1.5(40\%)$ ) and  $Q_3 + 1.5(IQR)$  was 160% (i.e.,  $100\% + 1.5(40\%)$ ). Therefore, any scores beyond 0% and 160% would be considered as outliers. Because all data points in subject based quiz scores actually lied within the range of 20% and 100%, it may be said that there were no outliers in the data set and therefore, the results have not been affected by them.

Likewise, for the scores of responses to questionnaires,  $Q_3$  and  $Q_1$  were computed as 20 and 18 respectively and IQR was computed as 2. Lower and upper limits were computed as 15 (i.e.,  $18 - 1.5(2)$ ) and 23 (i.e.,  $20 + 1.5(2)$ ). Since all response scores to the questionnaire actually lied within the range of 15 to 20, the results were not affected by any outliers.

### **Discussion**

The results show that the use of story did not bring a significant difference in the learning of students when the learning was measured in terms of subject based quiz scores. However, the post-hoc power (i.e.,  $1 - \beta$ ) of the t-test used for the purpose was very low (i.e., 0.081). A low power means that the value of  $\beta$  is high; which in turn, refers to a high probability of accepting a null hypothesis when it is false. It is always desired to have a low value of  $\beta$  and therefore the chosen power in the priori power analysis was taken as 0.80 (that is, a  $\beta$  of 0.20). However, the results of the test could not achieve that high a level of power. The low post-hoc power achieved indicates that the test is working poorly and it is not rejecting the null hypothesis when it is false (Levin & Rubin, 1996, p. 395).

A low post-hoc power of a test, assuming  $\alpha$  as constant (i.e., 0.05), can be primarily due to two factors, that is, a low post-hoc effect size and/or a small sample size. If we assume that the sample size is sufficiently large (as determined in a priori analysis) then the low post-hoc power can be attributed solely to the low post-hoc effect size. Could it mean that the quiz used as an instrument of measuring learning, is unfit for the purpose? Since a Cronbach's alpha of 0.74 for the subject based quiz indicates a good level of internal consistency, a possible reason for the low effect size could be that standardised testing (like the quiz in the present study) is based on pre-conceived outcomes (like the proportion of correct answers in the present study) which may not be a measure of true learning. The real understanding of a subject arises from the way in which it is taught and the use of stories allows students to throw themselves into imagination and play; which should be the purpose of teaching and learning (Doecke, 2015).

Storytelling in the present study has facilitated the students to play the game individually where each student has observed her/his outcome in comparison to other students' outcomes and noticed the variability in the results. Hence, they have understood the concept of expected return and risk through a first-hand experience. Even though the solution might be fixed in a scenario based story (like the value of expected winning of 270,000 coins per draw and a variation of 564,003 coins in the present study), a student has to imagine a lot on his/her own to comprehend that solution. This kind of experiential learning is in accordance with the conclusion drawn by Gold & Holman (2001) that storytelling facilitates multiple perspective taking and learning through joint actions with others.

The results suggested that students' level of interest as well as their engagement level was higher while learning through storytelling. The high level of students' interest was also observed by instructors during narration of the story in the form of an upright posture of almost all the students instead of a slouching one of many of them in a regular lecture. The emotions of dismay (at the time of description of

demons in the story), of relief (at the time of siblings' win in the game) and of fear (at the time when one of the demons charged towards the sister) were explicit on the faces of many students. There was almost a hundred per cent eye contact with the students during narration of the story. The enthusiasm with which they prepared chits, played the game and discussed their results justified the higher level of their engagement during the lecture.

The results further suggested that the use of storytelling is capable of inculcating human values besides explaining the intended topic. If the use of stories can teach human values along with the subject (which was Finance in the present study) then the students would get a wholesome learning and make them good human beings instead of limiting them to be only good subject experts. This is in accordance with conclusion drawn by Doecke (2015) that use of stories are not simply a form of knowing but a vital means of making the world human to us.

If we, having passed out from college many years ago, try to recall what we learnt during lectures of our teachers there, we tend to remember only a few memories of either some interesting phrases used by some teachers or some incidents that happened during some of their lectures. Such memories are what we share with our next generation and many a times, with pride about the learning achieved therefrom. The results show that the students in the present experiment also believe that they will remember the story, and thereby the learning achieved, for a long time. They might tell their kids one day that they were taught a simple topic of expected return and risk in a lecture through a story that had demons and a treasure. Whether that will actually happen or not, could be known if the present students were asked about the same, may be, in an alumni meet a few years hence.

## Conclusion

On the basis of the experiment, it may be concluded that the impact of the use of storytelling was not visible in the subject based quiz scores but it did result in a better learning. The story was able to increase the level of engagement of students in the lecture and transported them into a world of imagination where they learned the subject of finance collectively with other students. The students felt that they will remember the learning achieved for a long time in future. Due to its capability of inculcating human values, instruction through the story can be said to have provided a wholesome learning which may prove helpful in making these students better humans rather than just finance experts.

## References

- Al-Mansour, N.S., & Al-Shorman, R. A. (2011). The Effect of Teacher's Storytelling Aloud on the Reading Comprehension of Saudi Elementary Stage Students. *Journal of King Saud's University – Languages and Translation*, 23, 69-76.
- Andrews, D. H., Hull, T. D., & Donahue, J. A. (2009). Storytelling as an Instructional Method: Definitions and Research Questions. *Interdisciplinary Journal of Problem-Based Learning*, 3(2). <https://doi.org/10.7771/1541-5015.1063>
- Barnes, L. B., Christensen, C. R., & Hansen, A. J. (1994). *Teaching and the case method: Text, cases, and readings*. Boston: Harvard Business School Press.
- Cobley, P. (2001). *Narrative*. New York: Routledge.
- Doecke, B. (2015). Storytelling and Professional Learning. *Changing English*. 22(2), 142-156, DOI: [10.1080/1358684X.2015.1026184](https://doi.org/10.1080/1358684X.2015.1026184)
- Egan, K. (1989). *Teaching as storytelling*. Chicago: University of Chicago Press.
- Egan, K. (1995). Narrative and learning: A voyage of implications, (pp 116-125), in H. McEwan & K. Egan (Eds). *Narrative in teaching, learning, and research*. NY: Teachers College Press.
- Egan, K. (1999). *Children's minds: Talking rabbits and clockwork oranges*. NY: Teachers College Press.

- Fraser, D. (2007). State education, spirituality, and culture: teachers' personal and professional stories of negotiating the nexus. *International Journal of Children's Spirituality*, 12(3), 289-305. DOI: [10.1080/13644360701714977](https://doi.org/10.1080/13644360701714977)
- Geanellos, R. (1996). Storytelling: a teaching-learning technique. *Contemporary Nurse*, 5(1), 28-35. DOI: [10.5172/conu.5.1.28](https://doi.org/10.5172/conu.5.1.28)
- Gerde, V. W., & Foster, R. S. (2008). X-men Ethics: Using Comic Books to Teach Business Ethics. *Journal of Business Ethics*, 77(3), 245-258. <https://doi.org/10.1007/s10551-006-9347-3>
- Gerstner, J. J., & Finney S.J., (2013). Measuring the Implementation Fidelity of Student Affairs Programs: A Critical Component of the Outcomes Assessment Cycle. *Research and Practice in Assessment*, 8, 15-28
- Gold, J. and Holman, D. (2001). Let me tell you a story: an evaluation of the use of storytelling and argument analysis in management education. *Career Development International*, 6(7), 384-395. <https://doi.org/10.1108/EUM0000000006054>
- Levin, R.I., & Rubin, D.S. (1996). *Statistics for Management*. (6<sup>th</sup> ed.). New Delhi: Prentice Hall of India
- Marques, J., Kumar Dhiman, S. & Biberman, J. (2014). Teaching the un-teachable: storytelling and meditation in workplace spirituality courses. *Journal of Management Development*, 33(3), 196-217. <https://doi.org/10.1108/JMD-10-2011-0106>
- Mello, R. (2001). The power of storytelling: How oral narratives influence children's relationships in the classrooms. *International Journal of Education and the Arts*, 2(1). Retrieved from <http://www.ijea.org/v2n1/index.html>
- Nelson, M. C., Cordray, D. S., Hulleman, C. S., Darrow, C. L., & Sommer, E. C., (2012). A Procedure for Assessing Intervention Fidelity in Experiments Testing Educational and Behavioral Interventions. *The Journal of Behavioral Health Services & Research*, 39 (4), 374-396. DOI 10.1007/s11414-012-9295-x
- Nguyen, K., Stanley, N., Rank, A., Stanley, L., & Wang, Y. (2016). The relationship among storytelling, values, and resilience of college students from Eastern and Western cultural backgrounds. *Journal of Poetry Therapy*, 29(2), 73-88. DOI: [10.1080/08893675.2016.1176162](https://doi.org/10.1080/08893675.2016.1176162)
- Salas, E., Wilson, K.A., Priest, H.A., & Guthrie, J.W. (2006). Design, delivery, and evaluation of training systems. In G.Salvendy (Ed.), *Handbook of human factors and ergonomics* (pp.472-512). (3<sup>rd</sup> ed.). New York: John Wiley & Sons.
- Savery, J.R. (2006). Overview of problem-based learning: Definitions & distinctions. *The Interdisciplinary Journal of Problem-based Learning*, 1(1), 9-20.
- Short, J. C., & Ketchen, D. J., Jr. (2005). Teaching Timeless Truths Through Classic Literature: Aesop's Fables and Strategic Management. *Journal of Management Education*, 29(6), 816-832. <https://search.proquest.com/docview/195703054?accountid=10461>
- Singhal, A. (2016). Teaching the topic of "Expected Return and Risk" Through the Art of Storytelling. *Journal of Emerging Technologies and Innovative Research*, 3(11), 1864-1871.
- Sunwolf (1999). The Pedagogical and Persuasive Effects of Native American Lesson Stories, Sufi Wisdom Tales, and African Dilemma Tales. *Howard Journal of Communications*, 10(1), 47-71. DOI: [10.1080/106461799246898](https://doi.org/10.1080/106461799246898)