THE EFFECTS OF PRE-READING ASSIGNMENTS ON ACADEMIC PERFORMANCE

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1. Abstract

This research study sought to determine whether pre-reading assignments have an impact on a student's academic performance. Learning a new topic which oftentimes seems foreign is never easy. However, reading a short article or reviewing a slide-show presentation on the lecture topic before the lecture happens (otherwise known as a pre-reading assignment) can help alleviate the many burdens of learning new in-class concepts. The research participants consisted of thirty American undergraduate college students and were divided into either a control or experimental group based on the alphabetical order of their last name. Each participant took two of the same financial literacy tests which served as their pretreatment and posttreatment comprehension tests. An elementary level article on investing from Investopedia outlined the background information of the lecture on financial literacy. The article served as the pre-reading assignment and was administered solely to the experimental group. Both groups were asked to attend a series of small interactive lectures in order to measure the difference between their pre-lecture test scores and their post-lecture test scores. The findings were analyzed statistically through three Hedge's G Tests to identify means, standard deviations, and T values. It was found that the difference in test scores between the control and experimental groups were statistically significant at a .05 significance level as students in the experimental group outperformed the control group by roughly 9%. Implications include the potential integration of pre-reading assignments across universities in order to help improve academic performance.

2. Introduction

Learning is a vital skill which is often-times ignored by broader organizations. For example, the United States Armed Forces during WW2 refused to commit to a widespread effort to give military personnel the ability to learn multiple languages quickly when there was a dire need to do so. The impacts of centuries of disregardment are seen today through the gaping holes in the modern education system. Data from 321 students who have completed the General Education Development program (GED) and are currently in an entry level college course shows that 53% of students are struggling academically or are underprepared when they step foot into the classroom (Lott, D. 2012). By measuring the weekly readiness of each individual and evaluating how it will affect their social life on campus, the researchers from the University Of New Orleans determined that the existing educational system is not sustainable. Given how more than half of students are underprepared, educators and education researchers have been trying to fix this problem using various methods from innovative technology to incorporating new and creative teaching strategies.

In spite of most of these attempts, the overall student academic performance has changed marginally since the beginning of the century (D'Angelo, C. 2018). These now worsening statistics are undoubtedly concerning to both educators and parents because learning serves as the fundamental pillar for growth and success (Sookchotirat 2005). The ability to grasp in-class concepts fuels innovation and critical problem solving skills out-side of the classroom. It gives students new ideas which help accelerate their cognitive development while developing and shaping new perspectives.

Although there are several strategies suggested to improve student academic performance, *pre-reading assignments* have proven to be a viable solution. Pre-reading assignments are resources shared with students before a lecture in order to expose students to new topics (Azizifar, A.2015). Research proves that providing pre-reading assignments is amongst the most effective methods for enhancing student academic performance. This especially applies to students with disabilities as previewing text, making connections to prior knowledge, and using graphic organizers showed a 15% immediate improvement in grades as well as the increased successful activation of prior knowledge (Markham, H.2012). A study conducted by McCrudden and Schraw (2010) reported similar findings concluding how pre-reading assignments can be a strong contributor to shaping a student's goals for learning. This conclusion was affirmed when 30 Saudi learners from Jazan University stated how pre-reading assignments allowed them to know what to expect in the classroom and what is expected from them outside of the classroom which makes them feel more prepared when introduced to language acquisition learning theories (Al-wossabi S., 2020). This is especially important as studies have shown that students who engage more often in the classroom tend to score higher on exams (Gammerdinger, W., 2018). Among other things, pre-reading assignments allow students to focus more keenly on topics they are not proficient at instead of diverting all their attention evenly across subjects that they are already excelling in. In this fashion, students can more effectively and efficiently learn by attending lectures with pre-existing acknowledgment of their inevitable weaknesses.

However, there are some challenges to using pre-reading assignments. For example, some pre-reading assignments may shift student attention to ideas that are less significant in the text thus missing out on the main ideas (Lyons, Y. 2017). Pre-reading assignments are inevitably

time consuming thus interfering with personal responsibilities at home or extra curricular activities. In addition students will require extra resources like chromebooks and other materials which not everyone has. This makes pre-reading assignments difficult to standardize across entire school districts (Mihrara, K. 2011).

3. Research Question

This research study will examine the following question: *What are the effects of pre-reading assignments on a student's academic performance?*

4. Methodology

In this study, the researchers incorporated an experimental design that uses quantitative data to examine the extent to which pre-reading assignments positively or perhaps negatively affected student academic performance. By lecturing the participants, the researchers were able to develop a more comprehensive understanding of their participants' thought processes as well as their academic abilities in order to establish concrete conclusions. Throughout this entire research process, the researchers encountered a pre-reading assignment's true outcomes, including its potential side effects.

4.1 Participants

There were 30 participants from the United States who took part in this experiment. The participants in the research were recruited based on a non-probability convenient sampling model

and were enrolled in an undergraduate college in either California or the Northeast. All of the participants were required to be fluent English speakers.

4.2 Data Collection Procedure

The participants were randomly assigned to one group of fifteen (the control group) and another group of fifteen (the experimental group) by alternating the first letter of their last name. For example, a name like Mathew *A*brams will be funneled into the experimental group while another name with the first letter of their last name coming after *A* like Maddy *B*acon will take part in the control group. This was done in order to remove any systematic differences between the participants in each group.

The fundamental design of the experiment for the control and experimental groups are tabulated in *Table 1*.

Table 1

S. no.	Control Group	Experimental Group
1.	Participant Registration	Participant Registration
2.	Participant Enrollment and Agreement	Participant Enrollment and Agreement
4.	Pre-Lecture Test	Pre-Lecture Test
5.	No Pre-reading Assignment	Pre-reading Assignment
6.	Lectures	Lectures

7.	Immediate Post-Lecture Test	Immediate Post-Lecture Test

Participants were contacted via email to inform them of this opportunity 2 weeks prior to the actual experiment with a basic digital form asking for their legal name, date of birth, and gender. Once the participants have met the participation criteria and filled out the digital forms, the participants were assigned to complete a registration form within two days from which they completed the digital form. The participants then filled out an agreement/informed consent form which introduced them to the purpose, procedure, risks, privacy, and benefits involved in the research experiment. Participants over the age of 18 were required to sign to confirm their voluntary participation in the research experiment. Parents of participants below 18 years signed the agreement form to confirm their son's/daughter's voluntary participation.

Participants in both groups took a pre-test which consisted of 10 questions that were required to be completed within 10 minutes. The questions in the pretest were straightforward but presented a challenge to the participants as they had little to no prior knowledge on the topic. The next component involved the participants in the experimental group reading an extensive 4000+ word article on investing by Investopedia (Hayes, A. 2022). The article, which was assigned 24 hours prior to lecture, briefly highlighted many topics that were introduced in the lectures. The article was specifically chosen as the language and flow easily resonates with readers who are completely new to the topic. Additionally, the article incorporated many real-life examples on top of its extensive detail which made the article more engaging. One notable drawback is the length of the article as some parts of the article were not covered

in the lectures and may have decreased the attentiveness of the reader over-time. *Table 2* outlines the topics discussed in the pre-reading assignment and the lecture.

Table 2

Lecture topic- What Is A Stock *Pre-reading assignment – Investopedia*	*Topics Covering In Lectures*
• What Is A Stock? • Types Of Stock • Why Companies Issue Shares • What Is A Stock Exchange? • Pro/Cons Of An Exchanged Listing • Investing In Stocks • Stock Market Indices • Largest Exchanges	• What Is A Stock? • Types Of Trading • IPO, Exchange, Shares, Ticker • Dividends • ETFs • Volatility, Leverage, Short Selling • Cryptocurrencies • MACD, RSI, Key Levels, Pennants • Fundamental Analysis • SWOT Analysis • Responsibility & Maturity

Next, all of the participants were sent a link via email to a zoom meeting for the online lectures. The lectures took place in small groups, usually between one and four students (to accommodate each person's daily schedule) and lasted for an average of 30-40 minutes each. The lectures were modeled after a traditional classroom-like presentation where a researcher used Google Slides accompanied by other resources like

charts and graphs to teach the students. Following the lectures, an immediate post-test was taken by all of the participants which was the exact same as the pre-test but with the questions arranged in a different order. The difference in test scores between the posttest and pretest across both groups was crucial to analyzing the impact of pre-reading assignments on the data retention of the participants.

4.3 Data Analytics Procedure

The data was quantitatively analyzed using the Hedge's G Test. The statistical test was run three times in order to analyze the effect size of the difference between test scores. The Hedge's G Test took into account the means and standard deviations of the pre-treatment and post-trestmeant scores for the both the control and experimental groups using the formula $(x1 – x2) / \sqrt{((n1-1)*s12 + (n2-1)*s22) / (n1+n2-2)}$.

The first test measured the difference in test scores between the pre-test and post-test scores within the control group; this was done in order to measure whether there was a statistically significant improvement in test scores without a pre-reading assignment. The second test measured the difference in test scores between the pre treatment and post treatment test scores within the experimental group; this was done in order to measure whether there was statistically significant improvement in test scores with a pre-reading assignment. The third test was administered in order to determine the effect size of difference in test scores between the control group and the experimental group thus questioning whether the improvement in the experimental group was large enough to be considered statistically significant when compared to the improvement in

the control group.

5. Results

The results are illustrated below under table 4, table 5, and table 6.

5.1 Results from the difference in test scores within the same group

Table 4: Financial literacy understanding for control group (N=15)

Control Group	Highest Score	Lowest Score	Mean	Standard Deviation	T-Value
Pre-Test	60%	0%	19.67%	16.29	1.98
Post-Test	90%	20%	56.00%	20.10	

Table 4 shows the highest, lowest, standard deviation and mean scores of the control group's pre-lecture and post-lecture tests. The post test results at a glance look significantly higher than the pre-test results as the Hedge's G Test evaluates any T value over 0.8 as having a "large" effect size. However, at a significance level of 0.05, the difference between the pre-test and post-test is not statistically significant as the T-Value of 1.98 fell just short of the significant T-Value of 2.145. Therefore there is an observable but not statistically significant difference within the control group.

Table 2: Financial literacy understanding for experimental group with pre-reading assignment (N=15)

Experimental Group	Highest Score	Lowest Score	Mean	Standard Deviation	T-Value
Pre-Test	50%	0%	20.00%	13.64	2.86

Post-Test	90%	20%	65.00%	17.56	

Table 2 shows the highest, lowest, standard deviation and mean scores of the experimental group's pre-lecture and post-lecture tests. The post test results at a glance look significantly higher than the pre-test results as the Hedge T Test evaluates any T value over 0.8 as having a "large" effect size. This is confirmed at a significance level of 0.05, where the difference between the pre-test and post-test is statistically significant as the T-Value of 2.86 surpasses the significant T-Value of 2.145. Therefore it can be concluded that the pre-reading assignment gave the students a significantly higher ability to understand and apply the concepts they gathered during the lectures.

5.2 Results from the difference in test scores between different groups

Table 3: Effect size of difference in test scores between control and experimental groups (N=30)

Mean Difference Of Control Group	Standard Deviation Difference Of Control Group	Mean Difference Of Experimental Group	Standard Deviation Difference Of Experimental Group	T Value
36.33%	3.92%	45%	2.53%	2.62

Table 3 shows the difference in test scores and standard deviations within the control group and the experimental group. The table shows how the experimental group had a higher mean difference than the control group. In other words, the students who had the pre-reading assignment gained more financial knowledge than the students who did not have a pre-reading assignment. This is reaffirmed in the

Hedge's G Test where at a T-Value of 2.62, the effect size between the control and experimental group is considered statistically significant at a .05 significance level. It can be concluded that the experimental group outperformed the controlled group thus establishing how pre-reading assignments are beneficial.

6. Discussion

6.1 Interpretation

The purpose of this research study was to identify whether pre-reading assignments had an impact on academic performance. The findings suggest that pre-reading assignments have an important role in influencing student academic performance. The statistically significant difference in the post-treatment and pre-treatment test scores between the experimental and control groups suggests that students who completed the pre-reading assignments have a more comprehensive understanding of the financial concepts covered in the lecture. This comes as pre-reading assignments bridge a student's pre-existing knowledge with the new content covered in the lecture thus allowing them to make connections, increase comprehension, and lead to more engagement during lectures.

The findings support the cognitive theory of learning which states that learners construct new knowledge based on prior knowledge. Therefore, pre-reading assignments act as a foundation which allows students to build upon it thus facilitating a more comprehensive and extensive understanding. It's worth noting that of the three Hedge's

G Tests which were performed, only one test was not statistically significant. The test which measured the difference between the post-treatment and pre-treatment within the control group was not statically significant thus establishing the idea of how pre-reading assignments can be used as a potential avenue to help improve academic performance. This was proven in table five where the difference between test scores for the experimental group was statistically significant thus suggesting how pre-reading assignments do have a measurable impact as the control group was not statistically significant but the experimental group was. This was seen in the sixth and final table where the difference in test scores between the control and experimental groups were statistically significant thus demonstrating how pre-reading assignments contribute to a significant impact as seen in the difference in test scores between both groups.

The findings recognize the importance of incorporating pre-reading assignments as a routine educational practice. By implementing pre-reading assignments, teachers almost artificially increase academic performance by providing students with relevant background knowledge thus enhancing their understanding on a variety of new topics. This is especially beneficial towards students who struggle to grasp concepts the first time it is presented to them or have limited prior knowledge in a specific subject area.

Furthemore, the use of pre-reading assignments extend beyond financial literacy towards various academic disciplines which can be used to improve a student's overall academic performance and learning outcomes across all subjects. Educators should consider using pre-reading assignments as a standard practice, tailoring them to meet specific goals in order to be used effectively.

6.2 Limitations

Some variables could not have been accounted for during this experiment. One major concern is each participant's prior knowledge before participating in the experiment. Many participants had no prior knowledge on the lecture topic. However, some of the participants had more knowledge on the lecture topic than others thus creating an unforeseen variable and an inequality which is seen throughout the research. Another variable may be the sample size of the experiment. Despite thirty participants being hard to reach, a larger sample size would have been less prone to experimental errors. Additionally, there was no way to identify whether the participants in the experiment diligently reviewed the pre-reading assignment. It is highly likely that some participants briefly skimmed the pre-reading assignment while others took a thorough look at the pre-reading assignment.

6.3 Previous Studies & Existing Knowledge Base

In comparison with previous studies, the findings in this research align with the general consensus that pre-reading assignments positively impact student academic performance. For example, Alemi, M. (2010) measured the effect pre-reading assignments had on students that are trying to learn a new language that are not native to them. The study found that the experimental group outperformed the control group with a mean of 9.62 compared to the control group mean of 6.02. Another study conducted by Azizifar, A. (2015) measured the extent to which vocabulary & questioning pre-reading assignments affected reading comprehension and found that the difference between the

post-treatment scores and pre-test treatment were statistically significant at a significance level of 0.05. Both studies among others followed similar procedures and had similar findings in the sense that the experimental group statistically outperformed the control group.

This study contributes to the existing knowledge base by providing additional evidence within the specific context of financial literacy. Many previous studies have evaluated pre-reading assignments in the context of reading and language learning, however, this study specifically examined the effects on a student's financial understanding which contributes to a more comprehensive understanding of pre-reading assignments across multiple academic disciplines. Moreover, this study adds to the existing studies by acknowledging some potential limitations. This research study addressed such limitations like variations in the participants' prior knowledge and diligence. By addressing these limitations, this study encourages other future research experiments to address these factors and refine the current understanding of the impact of pre-reading assignments.

6.4 Suggestions For Future Research

Future projects should evaluate a student's qualitative qualities the same way this research project evaluated a participant's quantitative qualities. This research doesn't account for the engagement and change in confidence of the participants, instead it solely focuses on academic ability. Therefore, future research projects can consider investigating if pre-reading assignments have any impact on the curiosity and

excitement of an individual during a class through an observational approach. Future research experiments are highly recommended to involve participants across a wider range of backgrounds, ages, and countries.

Another way to modify the research is to establish an accurate measure of a participant's diligence on their pre-reading assignment. As mentioned before, it is inevitable that students in the experimental group put varying amounts of effort into the pre-reading assignment. Therefore, one way to mitigate this deviation is to attach a quiz alongside the reading and require the participants to score above a predetermined score. The quiz will incline the students to read the entire passage before answering thus creating less of a deviation in the amount of effort put into the pre-reading assignment by each participant.

A third modification would be to remodel the lecture to create a more inclusive and engaging environment. The lecture took place online and occasionally asked participants to answer questions in order to keep them focused. However, a lecture which is more centered around the students will inevitably keep the participants more engaged and mitigate the results of outliers. This can be done by asking the participants to do ice breaker exercises and team related activities to make the lecture less about the material itself, but more about the general understanding of the content through engagement. With this style of teaching, there will be less of a difference in understanding between the students who understand it the most and the students who understand it the least thus creating more accurate results.

6.5 Conclusion

In conclusion, this study examined the effect of pre-reading assignments on academic performance. The findings indicate that pre-reading assignments have a statistically significant impact as students who completed the pre-reading assignment outperformed the students who did not complete the pre-reading assignment by 9%. Findings from previous studies only reinforce the results from this experiment as they have also demonstrated how pre-reading assignments have a positive impact on academic performance. This impact has broader effects on students including increased motivation, higher student efficiency, and the ability to create new ideas. Although pre-reading assignments have proven benefits, it comes with many challenges including the time-consuming nature and need for additional resources. The implications of this research suggest how pre-reading assignments should be used in college institutions in order to help many struggling students grasp new concepts with less hassle. In light of the limitations of this study, future research should consider incorporating a student's qualitative aspects by measuring its effects on engagement, curiosity, and confidence throughout the lecture as a result of the pre-reading assignment. Overall, the findings of this study contribute to the growing body within this field by supporting the use of pre-reading assignments as an effective strategy to improve academic performance. By implementing pre-reading assignments, educators can provide students with a solid foundation of knowledge and enhance their learning outcomes, ultimately fostering their growth and success in academia.

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