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Assessment 2

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I. Part 1

1. Sales Trend Over the Months

The dataset comprises sales transaction records taken from November to December 2019 and so represents sales over a two-month period. Total sales in November are £252,933. Top-sold items are Rabbit Night Light and Popcorn Holder.

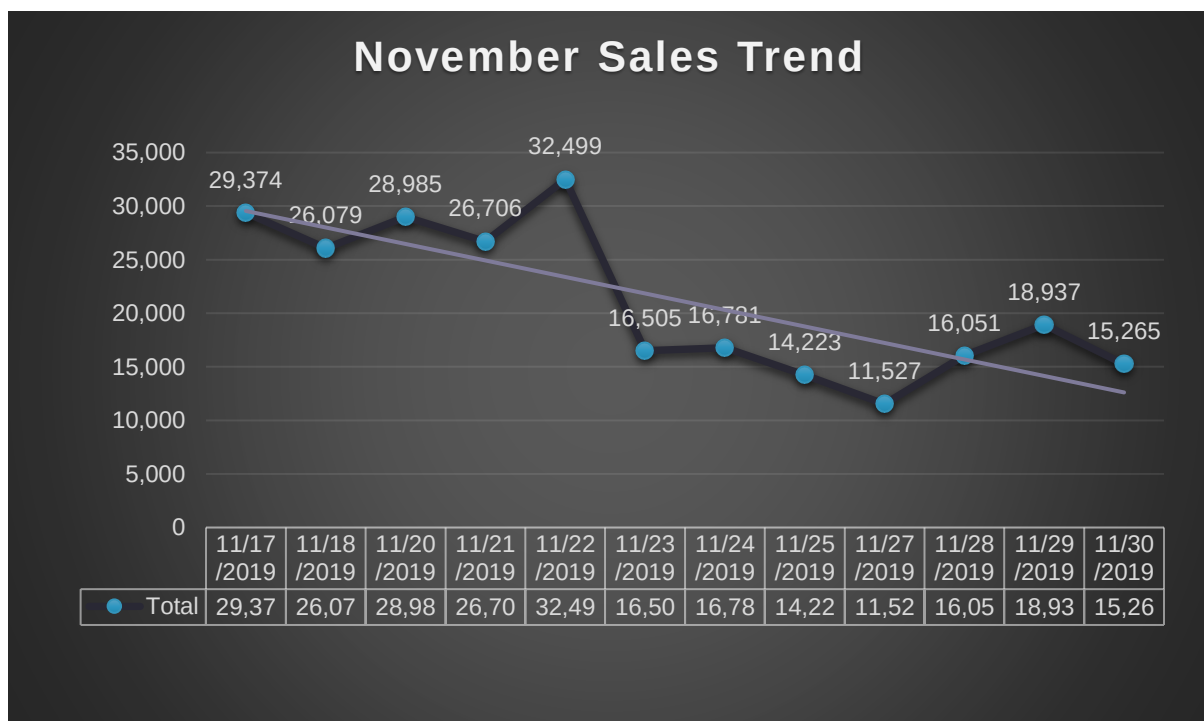


Figure 1: November Sales Trend

In December, £116,534 was made in total revenue. This might be as a result of the fact that, compared to November, clients only ordered the items on eight days during that month which is four days less.

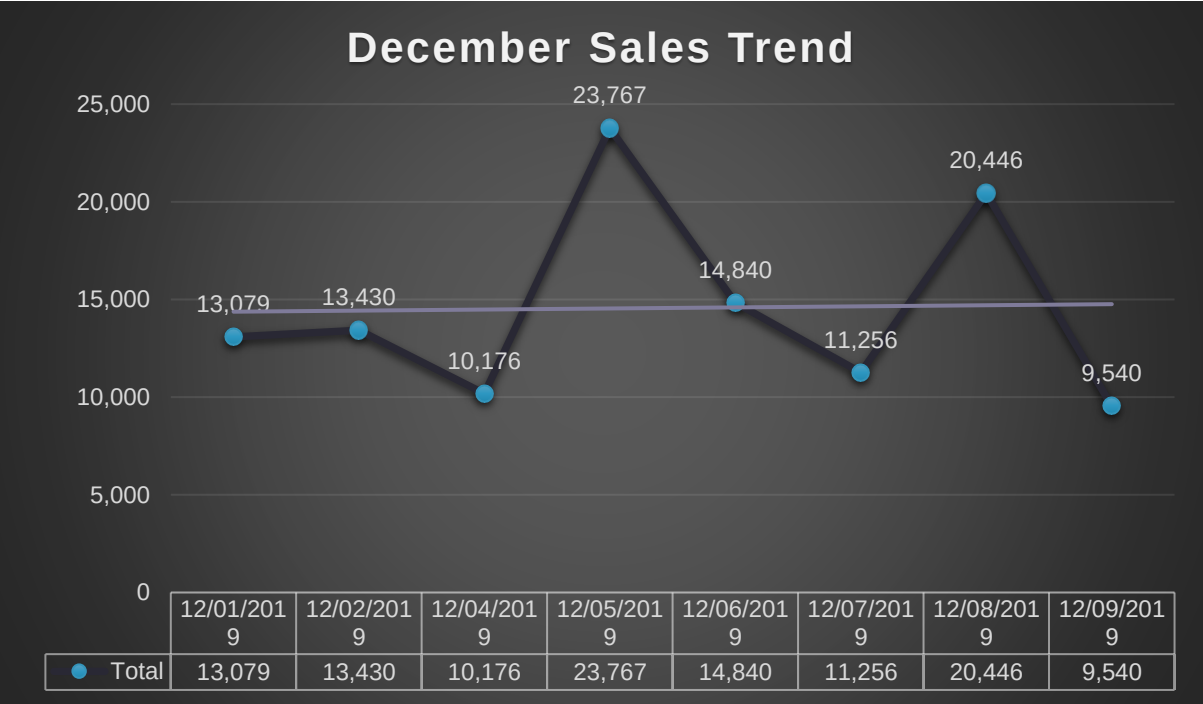


Figure 2: December Sales Trend

The data, unfortunately, it only covers a two-month period and it is hard to identify the seasonal patterns. Nevertheless, we shall experience periods of high and low correlation with the various activities that take place during the year.

The longer record of our sales would enable us to explore the annual patterns in detail. Yet, this is enough to get some reflections. It indicates the opening of the first-tier end-of-year shopping season and shows that later, the range of goods becomes more seasonal.

2. The Most Frequently Purchased Products

Going through the transaction data, we can specify the top-selling items for the November – December 2019 period. The dataset features all different product codes so we can observe which items were bought the most frequently.

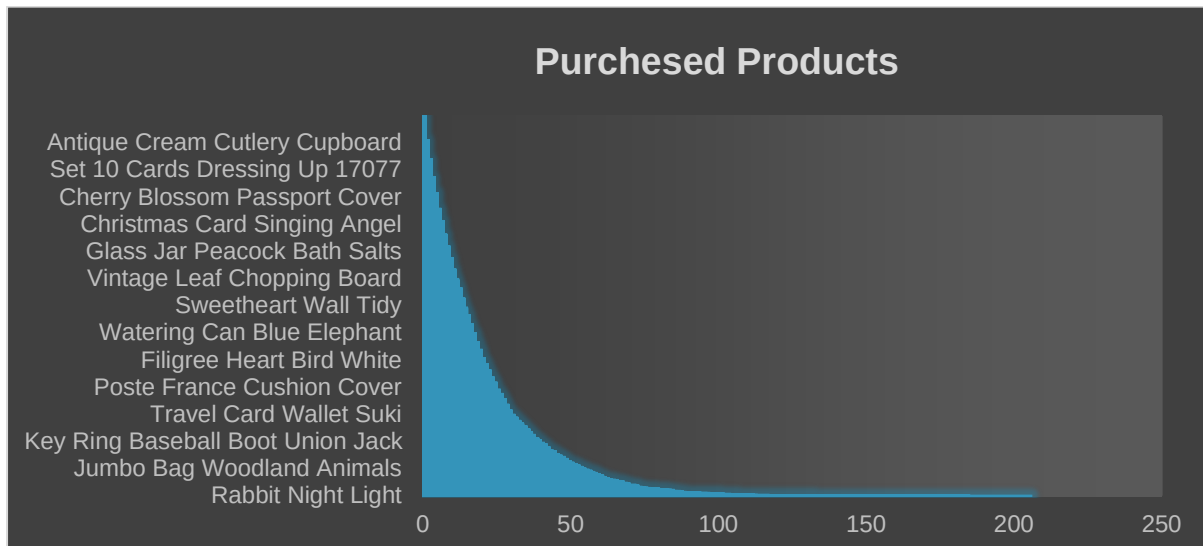


Figure 3: Purchased Products

The one that dominates in terms of sales quantity is Rabbit Night Light (206 units sold). The second most popular product is the Paper Chain Kit 50's Christmas (185 units sold).

Other frequently sold items include:

- Popcorn Holder (156 units)
- Paper Chain Kit Vintage Christmas (133 units)
- Gardeners Kneeling Pad Keep Calm (125 units)
- Hot Water Bottle Keep Calm (117 units)
- Jumbo Bag 50'S Christmas (113 units)
- 60 Cake Cases Vintage Christmas (112 units)
- Wooden Star Christmas Scandinavian (109 units)
- Hand Warmer Owl Design (107 units)



Figure 4: Most Frequently Purchased Products

The most frequently purchased products can collaborate with the most rarely purchased products.



Figure 5: Most Rarely Purchased Products

The product categories that are apparently strong sellers for this business include travel accessories, kitchen storage, timepieces, and seasonal/novelty stuff. These are centered around the core consumers' needs and interests within the home, gifting, and seasonal/holiday categories.

Consequently, although some items are sold in extremely high quantities, they were all in one or two large transactions. While other products were transmitted through more, but smaller transactions, the other way around was the case.

3. Products per Transaction

By examining the "Quantity" field for each transaction, we can calculate the number of individual products purchased in each one.

The transactions range greatly in terms of the number of products purchased:

- The smallest transactions involve the purchase of just 1-9 items.
- More common are medium-sized transactions
- Several larger transactions stand out, with quantities of 1,000-80,995 individual products.

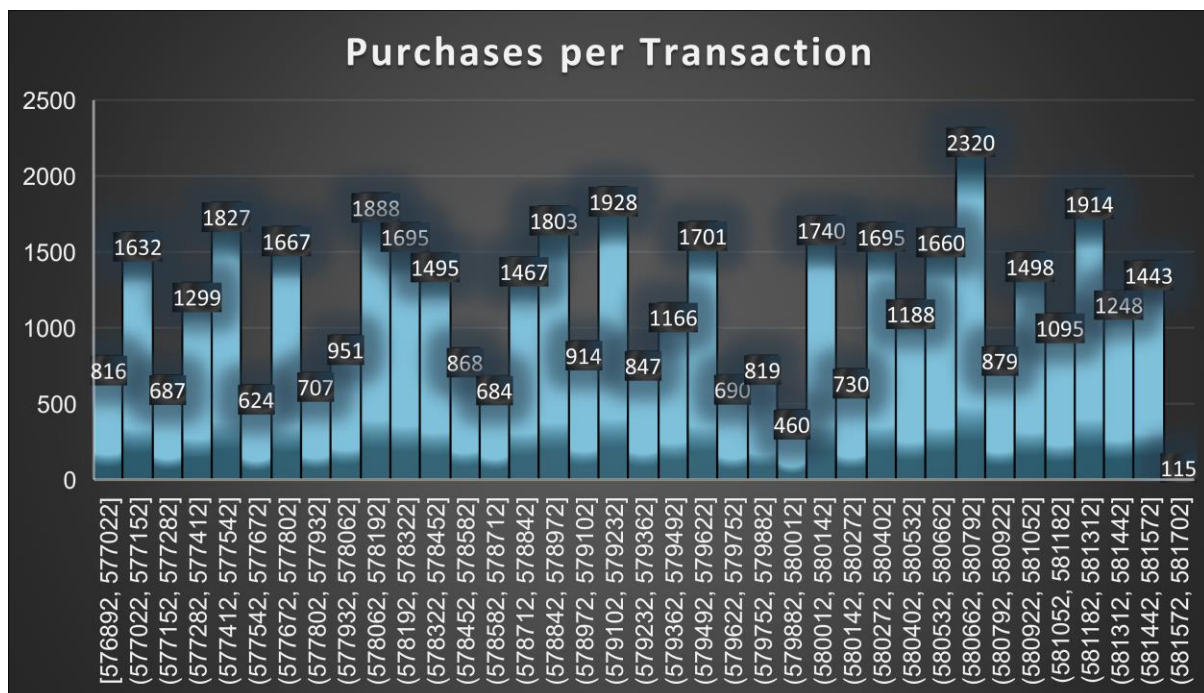


Figure 6: Purchases per Transaction

The data indicates that although there are great transactions being done, the business experiences good volumes of smaller but frequent orders from individual consumers. The range of order size and composition varies, and it is probably because of this that a well-balanced customer base is being created, one that does not mainly consist of large bulk purchases.

4. The Most Profitable Customer Segment

Calculating the AOV for each customer provides insight into which ones tend to place higher-value orders (BigCommerce, 2022).

This analysis suggests the business should focus on nurturing relationships with its highest spending customers in the United Kingdom, while also maintaining a diverse customer base that includes medium-value buyers. Recognizing the most profitable segments will allow the company to optimize its marketing, product, and service strategies accordingly.

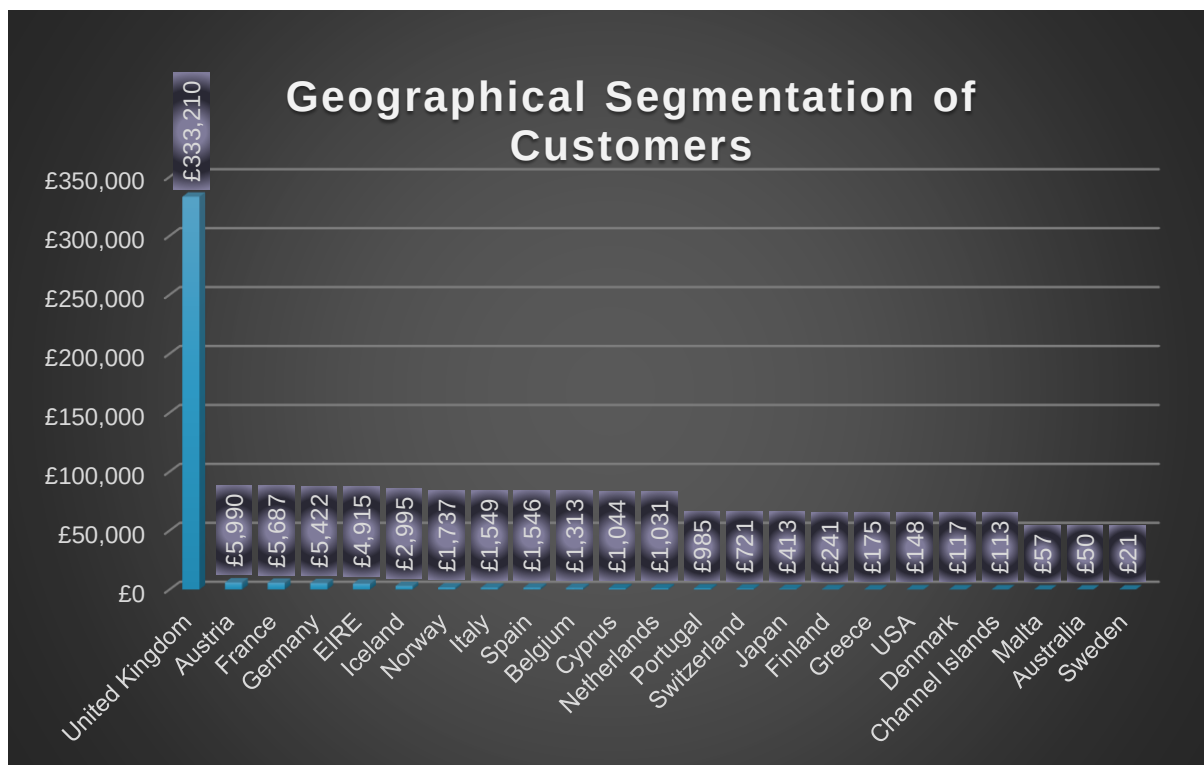


Figure 7: Geographical Segmentation of Customers

5. Strategy Recommended

1. Optimize the Product Mix:

- Keep on stocking and most importantly displaying the bestselling collection like the Travel Cards Wallets, Ceramic Jars, Alarm Clocks, and products that will be in demand for coming seasons or festive specials (FasterCapital, 2023).
- Argue out those products that may be supplemented with, or substituted for, the said bestsellers to increase the average order value.
- Introduce some kind of novelty and start with bestsellers in old but favoured categories, while being flexible and adaptable to the fluctuating wishes of customers.

2. Enhance the Customer Experience:

- Create a flawless omnichannel atmosphere and be available to customers via the website, shops, and other platforms (Leachman and Scheibenreif, 2023).
- Provide a loyalty program to make the consumers repeat business, especially from Norway and Britain are considered to be very high-value customers.
- Show personalized product alternatives and curated collections which are based on a customers purchase history and choice.

3. Target High-Value Customers:

- Spend a larger part of the marketing budget on gaining new customers in Norway and on keeping customers from UK who generate the highest incomes.
- Customize your promotional campaigns, make unique programs or packages, and offer VIP advantages to tier-1 customers so that they will spend more money on your firm.
- Utilize customer data and segmentation to better identify why certain customers have higher order values, and try to replicate the factors that drove this trend with other non-purchasing customers (MailChip, 2022).

4. Expand Internationally:

- Determine the feasibility of the business expansion and product range to include more international markets, specifically other countries in the European Region (Stevens,2019).
- Align the logistical, pricing, and marketing plans, which will be customized to cater to the needs of the various target markets to generate prospects.

- Work hand-in-hand with local distributors or influencers in a particular area to develop brand recognition and credibility in a new regulatory region.

5. Improve Operational Efficiency:

- Reengineer inventory management and fulfillment infrastructure so that you can minimize costs and increase margins, especially for products with high SKU volumes.
- Integrate data-driven forecasts and demand planning with purchasing to minimize stockout and excess inventory level.
- Automate repetitive tasks and digitize processes to enhance efficiency solve the issue of staff shortage and reassign their skills and competencies for more critical work (Li,2022).

By executing this multi-pronged strategy, the business can capitalize on the insights gleaned from the data to drive sustainable, profitable growth. It can deepen relationships with the most valuable customers, optimize the product mix, enhance the overall customer experience, and expand into new markets - all while operating more efficiently. This holistic approach should position the company for long-term success.

II. Part 2

1. Male and Female Students

If male=1 and female=2, the descriptive statistic shows that:

- Total students are 2,133 100%
- Male students are 1,056 or 49.5%
- Female students are 1,077 or 50.5%

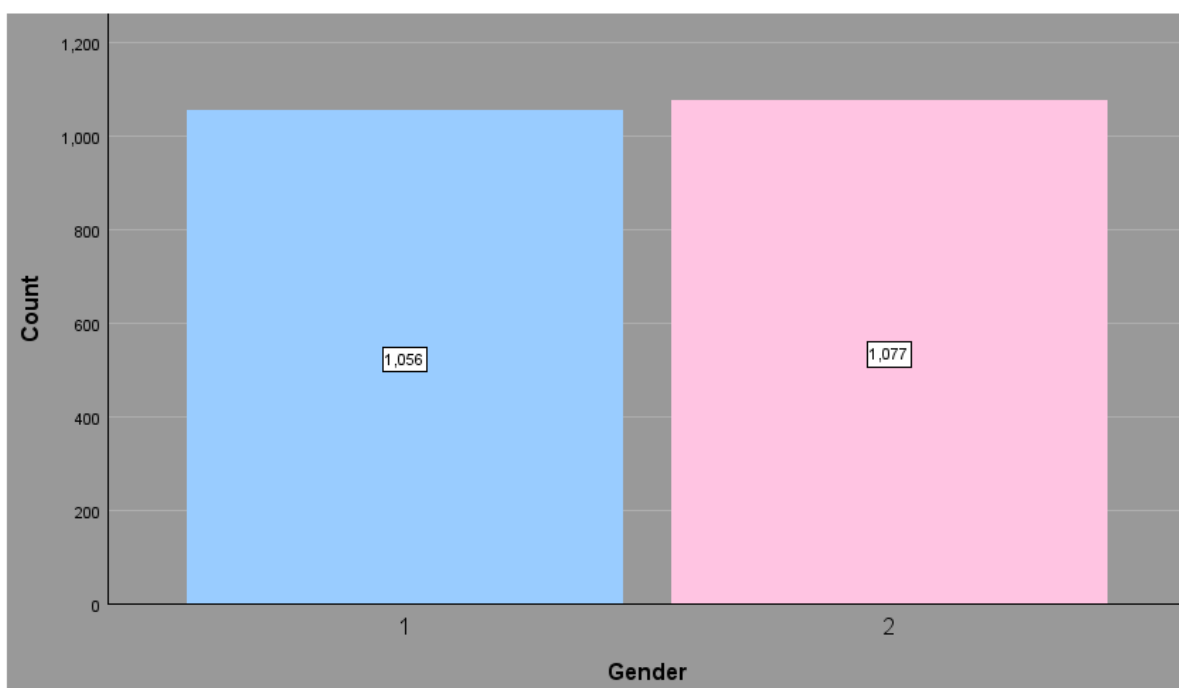


Figure 8: Male and Female Students

2. Qualified Free Lunch Students

Based on the descriptive statistics, if students who are qualified for reduced/free lunch are 0, and students who are not qualified are 1:

- The qualified students for free/reduced lunch are 1,215, or 57% of 2,133 students
- Not qualified students for reduced/free lunch are 918, or 43% of 2,133 students

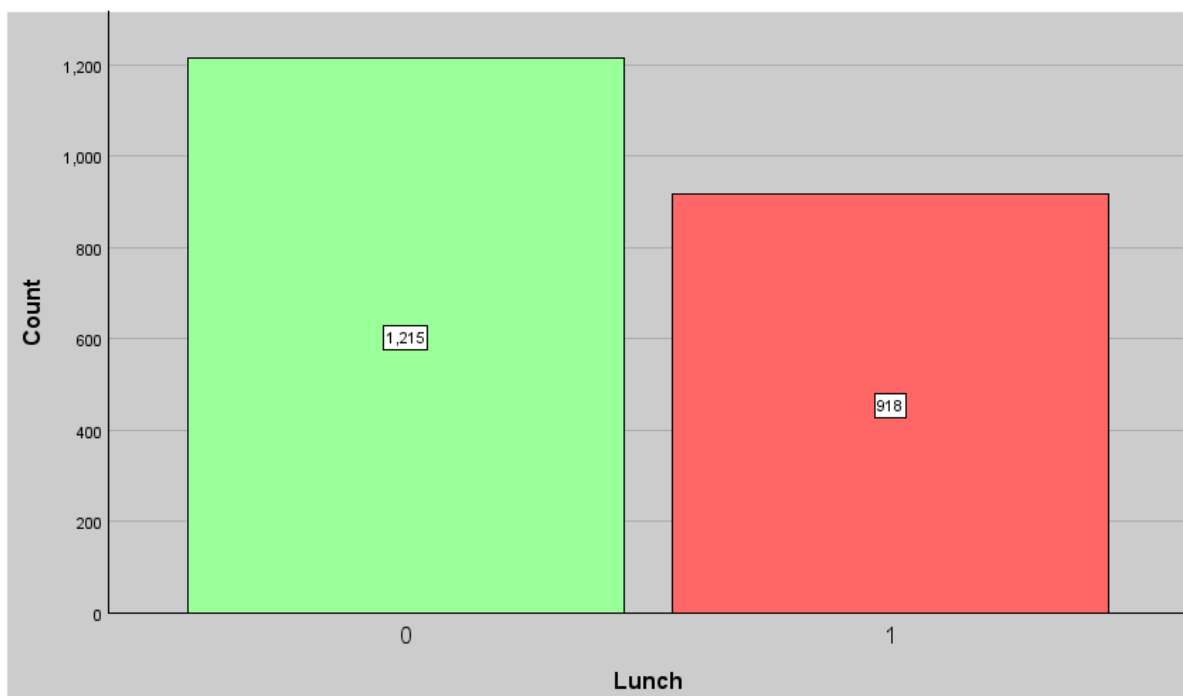


Figure 9: Students, who Qualify and Do Not Qualify for Reduced/Free Lunch

3. Mean, Median & Variance of Students Who Qualify and Do Not Qualify for Free Lunch

According to descriptive statistics from SPSS, the mean of students who are qualified and not qualified for free/ reduced lunch is 0.43, and the median is 0.

Statistics		
Lunch		
N	Valid	2133
	Missing	0
Mean		.43
Median		.00
Variance		.245

Figure 10: Free Lunch Statistics

4. K-Means Clustering

If the students are grouped in two clusters:

- Cluster 1: 933
- Cluster 2: 1,140
- All students: 2,133

Final Cluster Centers

	Cluster	
	1	2
Pretest	43	65
Posttest	55	78

Figure 11: Final Clusters Centres

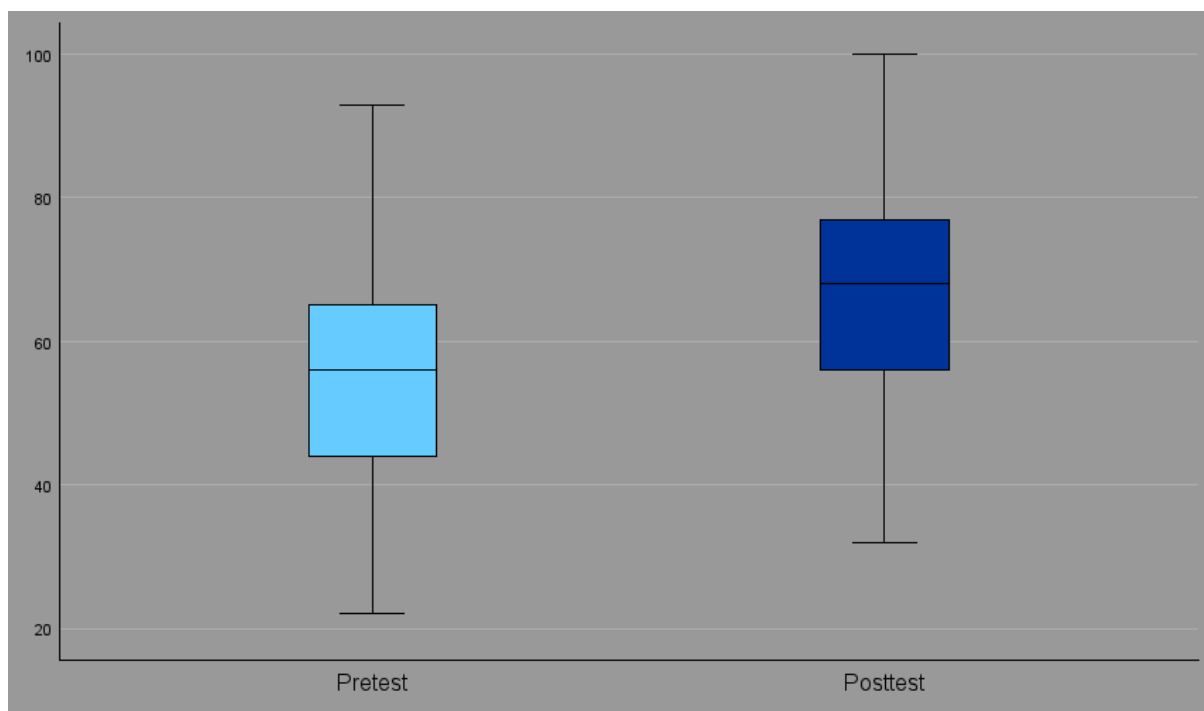


Figure 12: K-Means Clustering Analysis of Pretest and Posttest Students

5. Advantages & Disadvantages of Using Excel and SPSS

	EXCEL	SPSS
Advantages	➤ Usability ➤ Visualization ➤ Community Support	➤ Statistical Tests ➤ Visualization ➤ Data Handling
Disadvantages	➤ Statistical Tests ➤ Data Handling	➤ Usability ➤ Community Support

Figure 13: Excel vs. SPSS

- Excel's user interface is meant to be user-friendly and straightforward for people who are just beginning their journey with the programme. At the same time, it offers ample capabilities for those who have more experience and for those who are considered to be experts. Due to the abundance of functions and formulae that are easily available, calculations may be completed in a very short amount of time. Calculations can be carried out successfully as a result of this availability. Charts, graphs, and pivot tables are some examples of options and tools that facilitate the process of creating a visual representation of the data that has been provided. Every one of them is an illustration of a tool or choice that makes it simple to comprehend the facts shown graphically. The programme provides its users with the chance to participate in training and troubleshooting activities by providing a vast collection of materials, which includes forums, tutorials, and templates. It is possible that the utilization of these particular materials might be beneficial to the training process. Many people are committed to using it on a consistent basis, and there are a substantial number of them. Although Excel is capable of doing fundamental operations, it is not powerful enough to perform complex statistical analysis. Excel's capabilities include the capacity to perform basic operations. Spreadsheets are made possible by the application known as Excel. The programme has the potential to impede its ideal utilisation by causing it to operate more slowly or even crash. This might affect its overall performance. This is because

the application contains a staggering amount of data for which it is accountable, which is the reason why this is the case. Regarding the overall performance of the programme, it is probable that this will have a detrimental effect (Excel Starter2010, 2010).

- A programme that supports a broad range of statistical models, tests, and statistical analysis techniques is the Statistical Package for the Social Sciences (SPSS), which is a statistical software package. It is a useful tool for providing more complex and demanding interpretations of data since it is specialised in statistical analysis. Thus, it is appropriate for accomplishing these goals. When it comes to analysing and manipulating large databases, Excel is miles behind this application's effectiveness. The system has a large number of tools, each of which may create a unique visual depiction of any type of research and analysis. This compilation contains a variety of tools, such as boxplots, scatterplots, histograms, and descriptive analysis. This interface has a steeper learning curve and is a little harder for those who are just starting out in the workforce to understand than the Excel interface. It is a little harder to find assistance or answers quickly when it comes to SPSS because the community around it is much smaller than that of Excel. The most popular programming language is Excel (IBM Corporation,2012).

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