BSD1323 STORYTELLING AND DATA VISUALIZATION

SEMESTER II 2022/2023

GROUP PROJECT:

Unveiling the Study Pattern: A Journey of life as a Analytics Students

Prepared for:

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Prepared by:

Group 7

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	SUBJECT: BSD1323 STORYTELLING AND DATA VISUALIZATION		**MARKS**: 90(30%)
	TOPIC: CHAPTER 3 to CHAPTER 8		
	GROUP PROJECT	**DUE DATE:** 23 May - 25 June 2023	
	GROUP PROJECT MEMBERS (ID, NAMES, SECTION) 1. 2. 3. 4.		

GROUP PROJECT: MARKING SCHEME

CLO	Description	PLO mapping	Percentage	Marks
CLO2	Demonstrate the data visualization skill using an effective storytelling.	PLO2: Cognitive Skills and Functional work skills with focus on Numeracy skills C3: Application	10%	30

LEVEL OF ACHIEVEMENT				
1 **Inadequate**	**2** **Emerging**	**3** **Developing**	**4** **Good**	**5** **Excellent**

QUES.	ELEMENTS	MARKS	LEVEL OF ACHIEVEMENT
1&2	a. At least 2 weeks daily data from all members. b. At least 1 Date data type in the dimension shelf. c. At least 2 Categorical/qualitative data types in the dimension shelf. d. At least 1 Geographic data type in the dimension shelf. e. At least 3 Quantitative data types in the measure shelf.	**5**	
3	a. A catchy title and a clear storyline. b. At least 7 story points. c. Combination of text, image, worksheets, and dashboards. d. Combination of several types of visualization from each data field types. e. Interactive visualizations (include filters and animation).	**5**	
TOTAL (10)			

CLO2 RUBRICS OF QUESTION 4								
CRITERIA	**LEVEL OF ACHIEVEMENT**						**WEIGHTAGE**	**SCORE**
	0 Non-existent	**1 Inadequate**	**2 Emerging**	**3 Developing**	**4 Good**	**5 Excellent**		
Motivation of your story	No motivation of the story provided.	Very little motivation of the story provided.	Motivation of the story provided but missing all major points.	Motivation of the story provided but unclear.	Clear and good motivation of the story provided.	Very clear and excellent motivation of the story provided.	0.5	
Detail explanation of the storyline	Failed to explain the storyline.	Not efficiently, effectively, and accurately explain the storyline.	Partly accurate, but not effectively explain the storyline.	Effectively explain the storyline but not accurate.	Accurately and effectively but not efficiently explain the storyline.	Accurately effectively, and efficiently explain the storyline.	1	
Detail analysation of each story point	Failed to analyse the story points.	Not efficiently, effectively, and accurately analyse the story points.	Partly accurate, but not effectively analyse the story points.	Effectively analyse the story points.	Accurately and effectively but not efficiently analyse the story points.	Accurately effectively, and efficiently analyse each story point.	2	
Concluding remark	No concluding remark provided.	Very little concluding remark provided and inaccurate.	Concluding remark provided but unclear and inaccurate.	Concluding remark provided but partly inaccurate.	Clear and good concluding remark provided.	Very clear and excellent concluding remark provided.	0.5	
						TOTAL (20)		

CLO	Description	PLO mapping	Percentage	Marks
CLO3	Display a powerful data visualization, report, dashboard or stories in solving various applications using appropriate software.	PLO3: Functional work skills with focus on Practical, and Digital skills P4: Mechanism	10%	30

CRITERIA	LEVEL OF ACHIEVEMENT						WEIGHTAGE	SCORE
	0	1 Inadequate	2 Emerging	3 Developing	4 Good	5 Excellent		
Theory/ Knowledge on data visualization and dashboard	No theoretical knowledge on data visualization and dashboard observed.	Very little knowledge on data visualization and dashboard observed or some information is incorrect.	Some knowledge or information observed on data visualization and dashboard but missing all major points.	Some knowledge or information observed on data visualization and dashboard but still missing some major points.	Good knowledge on data visualization and dashboard observed, missing some minor points.	Excellent knowledge on data visualization and dashboard observed; provides all necessary background principles.	1	
Techniques on Story & Data Validation	Failed to create a story.	Inappropriate techniques on story are demonstrated.	Partly correct techniques on story are demonstrated with partly valid data.	Correct techniques on story are demonstrate with partly valid data.	Good techniques on story are demonstrate with valid but not completely accurate data.	Competent techniques on story are demonstrated with valid and accurate data.	2	
Efficiency/ Assembly/ Tidiness	Failed to demonstrate the given task.	Not efficiently, effectively, and neatly demonstrated the given task.	Partly efficient, but not effectively and neatly demonstrated the given task.	Efficiently, but not effectively and neatly demonstrated the given task.	Efficiently and effectively but not neatly demonstrated the given task.	Efficiently, effectively, and neatly demonstrated the given task.	1	
The story points result	Failed to create any story point	Lack of story points / zero readability of the result. Poor originality.	Partly complete the story points.	Story points are presented but at low readability. Reader has to guess some of the missing information. Less originality.	Clear and neat presentation of story points. All required results are presented. Readability. Complete with labels, title, axes, etc.	Very clear and neat presentation of story points. All required results are presented. High readability. Very complete with labels, title, axes, etc.	1	
Results (interactive features)	No interactive data visualization and story points.	Lack of interactive data visualization and story points.	Very minimal interactive data visualization and story points are shown.	Barely interactive data visualization and story points are shown.	Clear interactive data visualization and story points are shown.	Highly interactive data visualization and story points are shown.	1	
						TOTAL		**30**

CLO	Description	PLO mapping	Percentage	Marks
CLO4	Work collaboratively as part of a team to solve given problem through group discussion and presentation.	PLO4: Functional work skills with focus on Interpersonal skills A3: Valuing	5%	15

CRITERIA	LEVEL OF COMPETENCY					WEIGHTAGE	SCORE
	1 Very Weak	2 Weak	3 Fair	4 Good	5 Very Good		
Foster Good Relationship	No clear evidence of ability to foster good relationships and work together effectively with other group members towards goal achievement.	Able to foster relationship and work together with other group members towards goal achievement but with limited effect and require improvements.	Able to foster relationship and work together with other group members towards goal achievement with some effect(s) and require minor improvements.	Able to foster good relationship and work together with other group members towards goal achievement.	High ability to foster good relationship and work together effectively with other group members towards goal achievement.	1	
Alternate Roles	No clear evidence of ability to assume alternate roles as a group leader and group members demonstrated in practice.	Attempt to demonstrate in practice the ability to alternate roles as a group leader and group members but with limited effect and require improvements.	Able to demonstrate in practice the ability to assume alternate roles as a group leader and group members with some effect(s) and require minor improvements.	Able to demonstrate in practice the ability to assume alternate roles as a group leader and a group member to achieve the same goal.	Show clear evidence to assume alternate roles as a group leader and a group member demonstrated in practice.	1	
Respect and accept opinion	Not able to respect and accept opinion of others that leads to conflicts	Limited respect and acceptance of others' opinions in achievement group's objectives	Able to respect and accept opinion of others in achieving group's objectives	Able to well respect and accept opinion of others in achieving group's objectives	Able to very well respect and accept opinion of others in achieving group's objectives	1	
					TOTAL (15)		

***Note:** A self and peer review questions will be given to each of the student to assess their group member and their teamwork and the outcome will assist lecturer to assess the CLO4 rubric.

CLO	Description	PLO mapping	Percentage	Marks
CLO5	Demonstrate an active communication through group discussion and presentation.	PLO5: Functional work skills with focus on communication skills A3: Valuing	5%	15

CRITERIA	LEVEL OF COMPETENCY					WEIGHTAGE	SCORE
	1 Very Weak	2 Weak	3 Fair	4 Good	5 Very Good		
Clear delivery of ideas	Not able to deliver ideas clearly and require major improvements	Able to deliver ideas and require further improvements	Able to deliver ideas fairly clearly and require minor improvements	Able to deliver ideas clearly	Able to deliver ideas with great clarity	3/5	
Confident delivery of ideas	Not able to deliver ideas confidently	Able to deliver ideas with limited confidence and require further improvements.	Able to deliver ideas fairly confidently and require minor improvements	Able to deliver ideas confidently	Able to deliver ideas with great confidence	3/5	
Effective and articulate delivery of ideas	Not able to deliver ideas effectively	Able to deliver ideas with limited effect and require further improvements	Able to deliver ideas fairly effectively and require minor improvements	Able to deliver ideas effectively and articulately	Ability to deliver ideas with great effect and articulate	3/5	
Understand and respond to questions	Not able to understand and respond to a question	Able to understand and answer questions but not able to accurately answer the question	Able to understand and answer questions satisfactorily	Able to respond to questions well	Able to fully understand and respond to questions very well	3/5	
Adapt delivery to audience level	Not able to deliver appropriately to the audience level	Able to deliver ideas with limited appropriateness to the target audience and require further improvements.	Able to deliver ideas appropriately to the target audience satisfactorily	Able to deliver ideas appropriately to the target audience well	Able to fully deliver ideas appropriately very well	3/5	
					TOTAL (15)		

CONTENT

1.0 MOTIVATION

Every student's academic path revolves around their study schedule, which impacts their learning results and overall success. Our team was inspired to investigate the study schedule among UMP students after realizing the value of efficient study habits and time management. We sought to learn more about various facets of our members' study routines by gathering daily data from all of them for two weeks.

Understanding UMP students' study schedules might provide essential details about their favourite study environments, subjects, study methods, study materials, study habits, and even the costs associated with their study routines. These characteristics can be examined for patterns and trends that help us develop suggestions and plans for improving study habits.

Our goal to equip UMP students with knowledge and suggestions for enhancing their study habits drove us to conduct this study. By comprehending the routines and preferences of UMP students, we might create resources and support systems specifically designed to boost their educational experiences.

In conclusion, our motivation for examining the study habits of UMP students is based on the conviction that better academic achievement may be attained by comprehending and maximizing study habits. We want to empower UMP students by analysing the data and making recommendations. In addition, we want to further the dialogue on intelligent study habits in the data analytics community and beyond.

2.0 STORYLINE EXPLAINATION

The team members are introduced in the first storyline, which also gives a general description of the project. It discusses the study's objectives and outlines how data analysis and suggestions would empower UMP students.

This insight analyses the several components of a study schedule, including the location where you study, the time you study, the material you study, the method you use to study, the amount of money you spend studying, and so on. It shows the interactive components and filters built into the visualisations to allow users to examine the data according with their choices.

In this insight, UMP students' two-week study routines and behaviours are examined. It seeks to identify the most suitable location, preferred study techniques, and time allocation for multiple fields of study. The results can benefit teachers in developing targeted support strategies and help certain students optimise their learning potential.

This plot line looks at how students' study for various subjects. It examines whether students prefer studying alone or with others in groups and determines the subjects that call for greater cooperative learning techniques. This plot examines the various study techniques students utilise, including exercise, memorization, taking notes, and revising. It emphasises the use of notetaking and revision strategies.

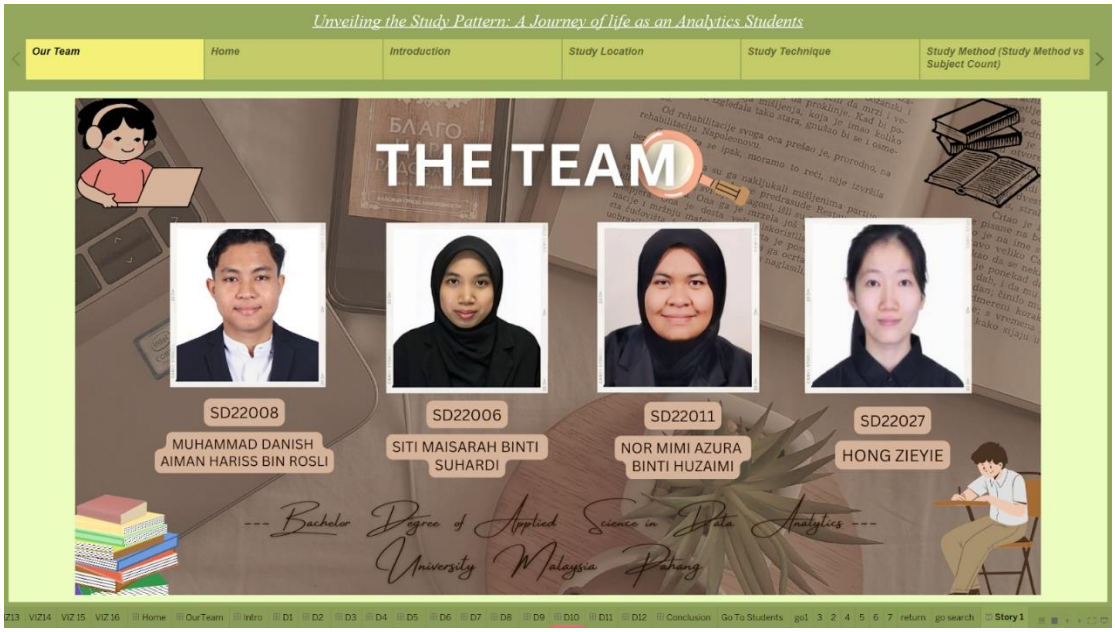
This story illustrates a cumulative bar chart that shows the study time that students specialised to different subjects for the past two weeks, which is the data collecting period that receives the most attention and the subject that requires the least study time.

This storyline is to focus on the materials utilised by the students for the various types of subjects, which are lecture notes and data analytics tools. The preference for lecture notes in subjects like Statistics and the utilisation of data visualisation software is highlighted and emphasised to improve skills in Data Visualization.

This storyline focuses on the study materials that students use for various subjects, including lecture notes and data analytics software. It highlights the preference for lecture notes in areas like statistics and the use of data visualisation tools to hone data visualisation abilities.

This storyline analyses the study habits that students use for various subjects, including lecture notes and data analytics software. It highlights the preference for lecture notes in areas like statistics and the use of data visualisation tools to hone data visualisation abilities.

3.0 ANALYSIS OF STORY POINTS

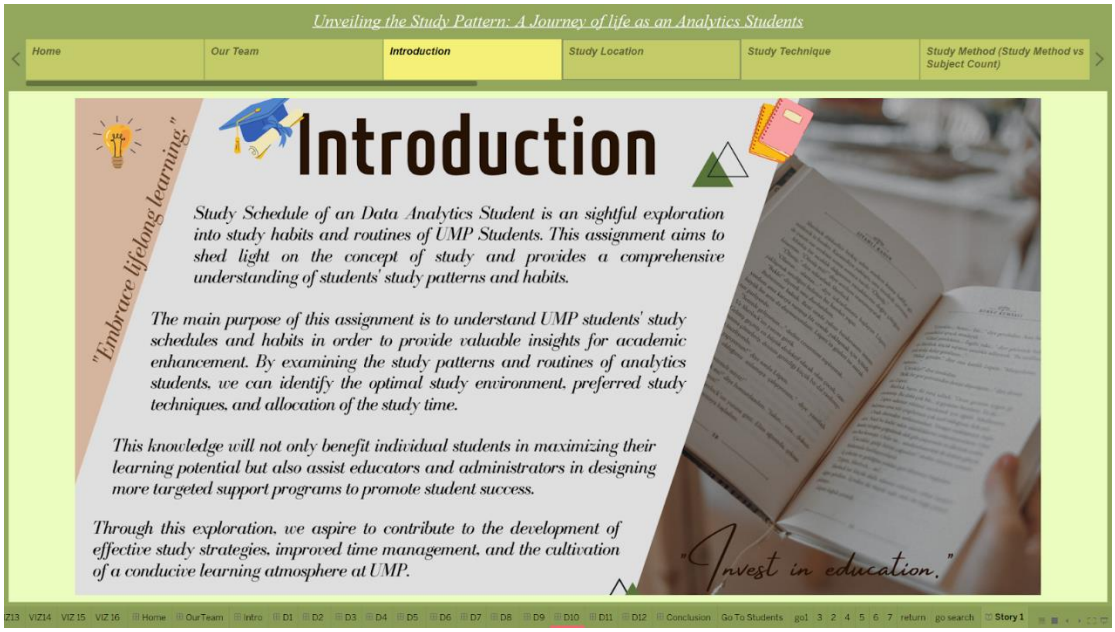


A brief introduction to our team members commences the first storyline. Our group consists of four people: Muhammad Danish Aiman Hariss Bin Rosli, Siti Maisarah Binti Suhardi, Hong Zieyie, and a male member named Muhammad Danish Aiman Hariss Bin Rosli. We are all pursuing studies at the University Malaysia Pahang's Bachelor of Applied Science in Data Analytics course. By establishing a relationship and sense of familiarity with the team members, this understanding prepares us for a deeper study of our research plan and the insights we will find during the assignment.

The storyline, known as "HOME," is an integral part of our assignment themed "A study life of a UMP analytics student." This storyline, derived from Dashboard 1 (D1), comprehensively explores various aspects of the study schedule. We have incorporated interactive features and filters in D1 to facilitate user exploration based on their interests.

At the top right corner of the dashboard, users will find seven icons representing different dimensions of the study schedule. These icons encompass the following areas Through the visualization, users can gain valuable insights into several key aspects. Moreover, we have incorporated a thought-provoking quote, "Success is the sum of small efforts repeated day in and day out." This quote subtly integrates action features that lead users to "7 effective tips for studying data science and analytics." These tips are designed to offer users detailed insights into effective study strategies specifically tailored to data science and data analytics.

In summary, the "HOME" storyline and Dashboard 1 offer a comprehensive and interactive visualization of the study schedule among UMP analytics students. It covers various dimensions, including study location, study time, study subjects, study technique, study habits, and expenditure. It also provides valuable tips for studying data science and analytics effectively.

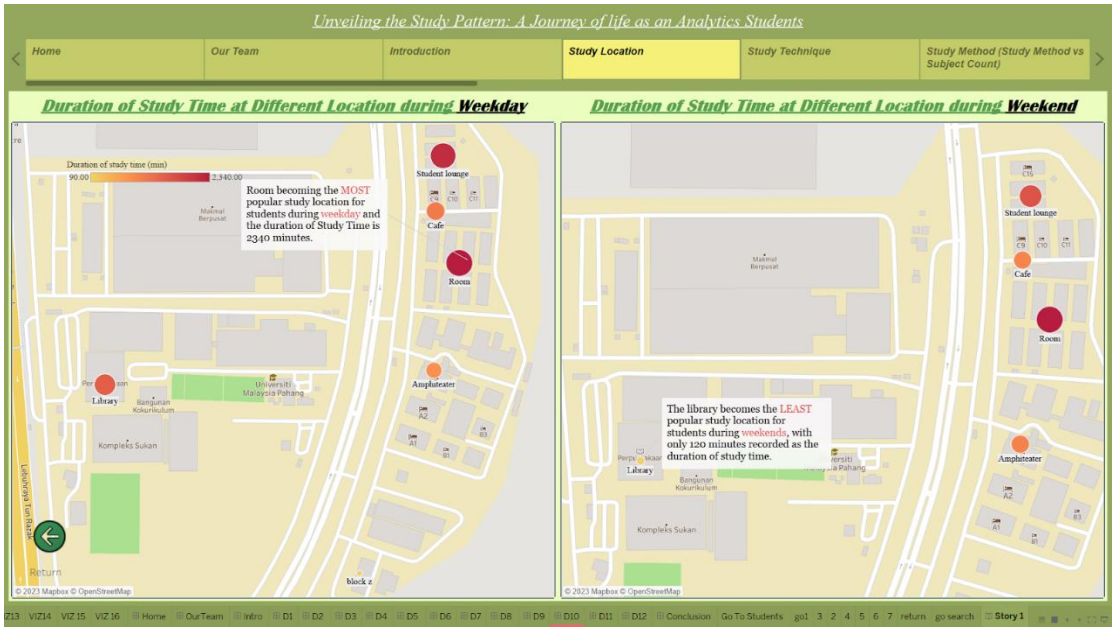


Study Routine of a Data Analytics Student is a fascinating look at the two-week-long study habits and routines of UMP Students. This assignment seeks to clarify the idea of studying and offers a thorough insight into students' study habits and routines.

This assignment's primary goal is to comprehend UMP students' study routines and habits to offer insightful advice for improving academic performance. We can determine the ideal study environment, preferred methods, and time allocation by analyzing students' study habits and routines. This information will help individual students maximize their learning potential and help educators and administrators create more specialized support initiatives to boost student achievement. We hope that this research will aid in creating efficient study methods, better time management, and establishing a supportive learning environment at UMP.

We will explore several topics, including the scheduling of study time, selection of study places, subjects given priority, preferred study techniques, use of study materials, and study habits, through an in-depth analysis of UMP students' daily study schedules. Understanding these elements allows us to spot trends that boost academic success and create evidence-based suggestions for students to improve their study routines.

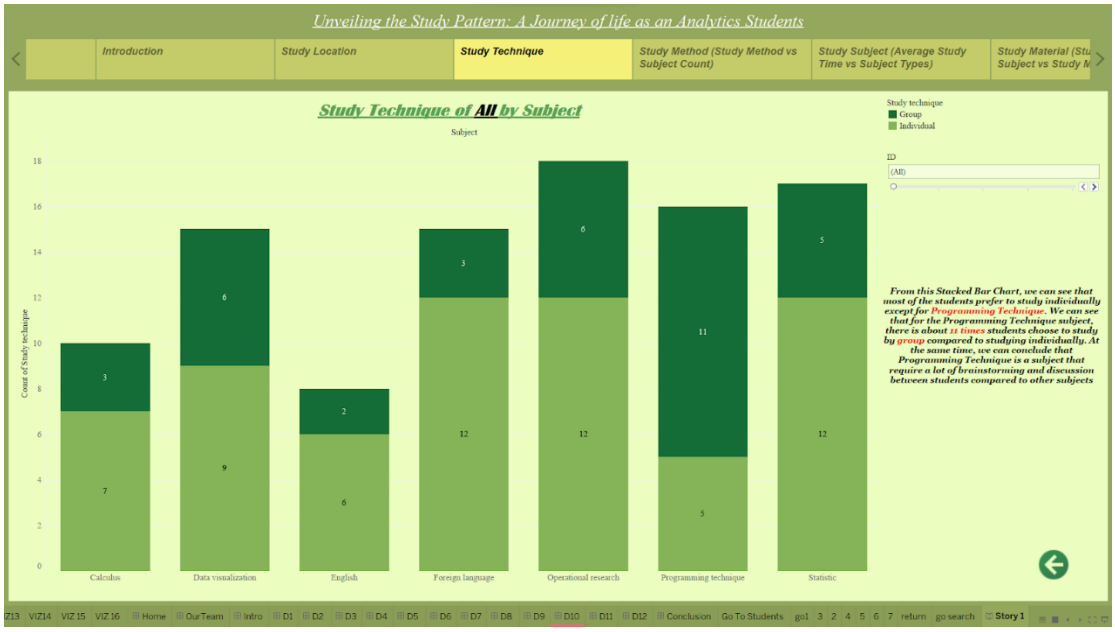
This assignment intends to reveal UMP students' study patterns and practices to offer insightful information into the daily lives of analytics students, providing a more profound comprehension of their study habits and aiding in developing an academic atmosphere that fosters success.



This story tells about the duration of study time at different locations during weekdays and weekends. In this dashboard, an action feature called "Return to Homepage" redirects users back to the homepage. Based on the provided map visualisations, it can be concluded that the room is the most popular location among students at UMP. It means that students think of their room as a suitable place that encourages focus and production. Students may feel more at ease and at room in their own study area, which helps them concentrate on their academic work. On weekdays, block Z appears to be the least popular study location. This might be because of a number of factors, including its distance from other facilities compared to other campus locations for studying.

When it comes to weekends, the library, cafe, and amphitheater are shown as the least popular study locations in both visualisations. According to the visualisation, students typically spend more time studying in their dorms. Library is the least popular location for study with only 120 minutes recorded as the duration of study time. This might be explained by the fact that students frequently have additional free time on Saturdays, letting them focus longer periods of time on studying.

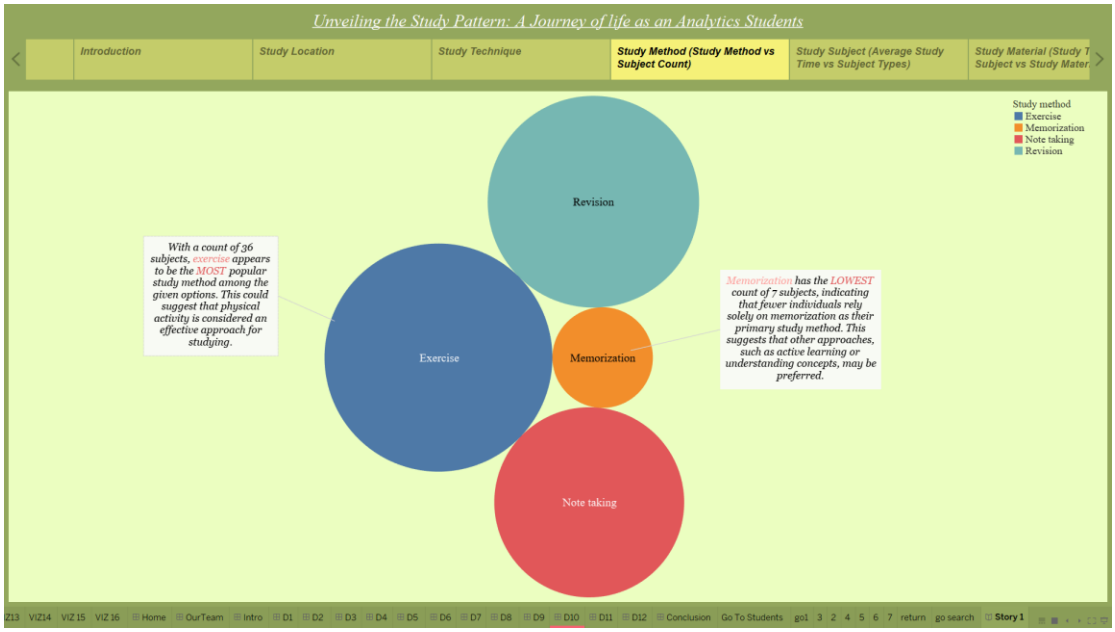
Overall, the visualisations highlight the preference for individual study spaces and a lower use of several campus locations for academic reasons. When it comes to improving and optimising the present analysis rooms to better suit students' requirements and preferences, UMP can benefit from these findings.



From this story, we can analyse the study technique by subject for all students. For this visualisation, we use the stacked bar chart so we can easily compare for both study techniques. In this case, there are 2 types of study technique which is studying by group or individual. We also filter it by ID so we can review one by one on how many times students' study alone or with a group. Not only that, but an action feature also called "Return to Homepage" redirects users back to the homepage.

Most students clearly prefer studying independently utilizing the individual technique, except for the subject of Programming Technique, according to the overall data. This may be seen from the stacked bar chart, which shows that students chose group study for this particular subject 11 times more frequently than they did for individual study. This could result from the motivating and encouraging environment that group study can foster among pupils. Studying Programming Techniques could provide difficulties students find more straightforward to overcome in groups, enhancing their confidence and passion.

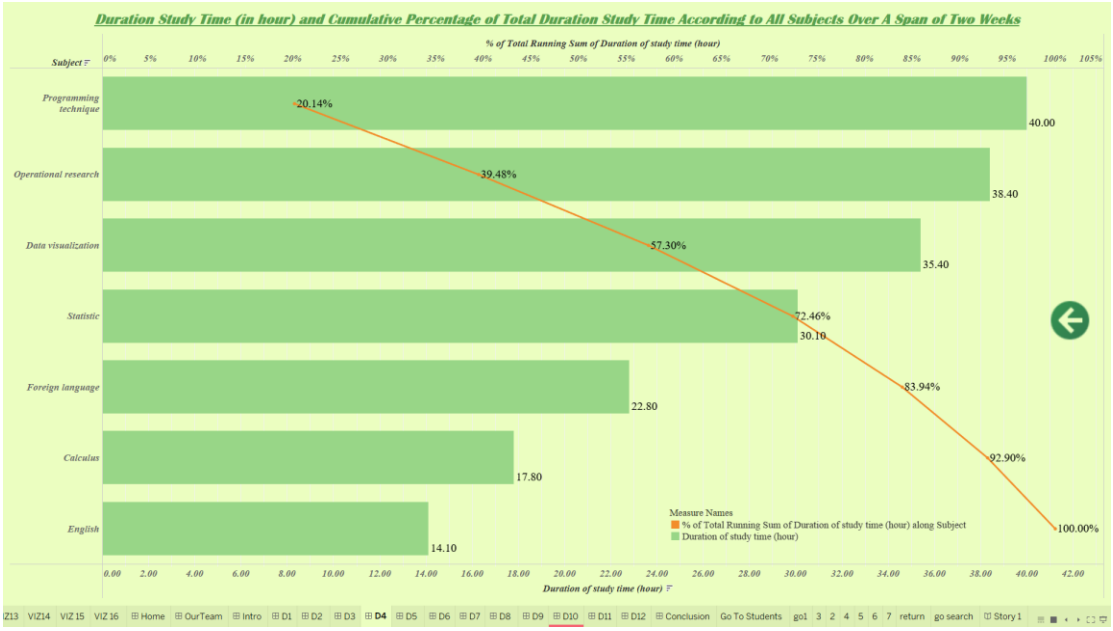
We can conclude that actually for Programming Technique is a subject that requires brainstorming and a discussion with a lot of people compared to any other subjects. Besides, we can also identify which subject that students spend studying the most which is Operational Research and the lowest number of students spent studying is English.



This packed bubble representation about study methods which exercise, memorization, note taking and revision that are used for study by subject. With a count of 36 subjects, exercise appears to be the most popular study method among the given options. It shows that a lot of people are aware of the benefit that exercise is for the brain and how it improves processing of knowledge. Exercise improves focus, memory, and overall learning outcomes in addition to offering some break from leisurely studies.

On the other hand, memorization has the lowest number of 7 subjects, meaning that fewer people use memorization as their primary study method. This suggests that other approaches, such as active learning or understanding concepts, may be preferred. Furthermore, the visualisation provides insights into the utilisation of note taking and revision as study methods. These techniques are used less frequently in some categories than others, which highlights their importance in different areas of study.

In conclusion, while a lesser amount of subjects related to memory suggests an increase towards more active methods of learning, the popularity of exercise explains the understanding of its beneficial impact on learning. By bridging the differences between exercise and memorization, the commonly used procedures of taking notes and revision give students powerful tools for organising material and setting up their understanding.

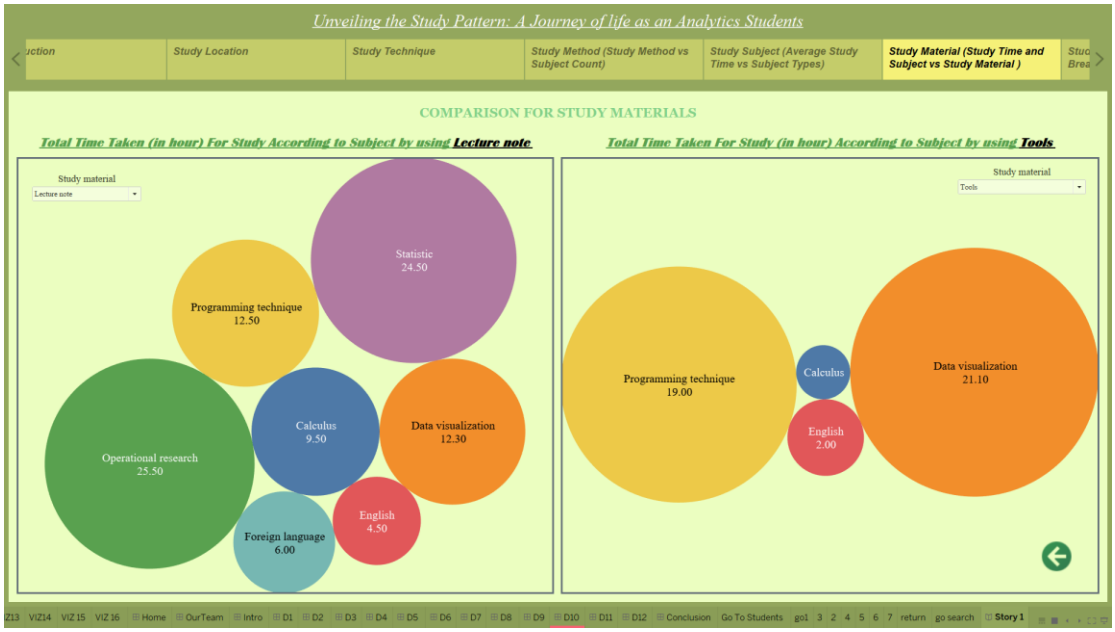


The cumulative bar chart insightfully reveals the two-week study habits of the group members. It shows that, with 40.0 hours of study time, members focused most of their study time on Programming Techniques. Operational Research and Data Visualisation are listed after this, demonstrating the importance and attention the students place on these subjects.

The assignment peak week during the two-week data collection period is one potential explanation for the significant amount of study time devoted to programming techniques. The requirement to finish programming assignments by the due date, which necessitates a lot of practice and review, is something that students frequently encounter during this period. As a result, group members probably spent extra time learning Programming Techniques to ensure they were knowledgeable and capable of finishing their duties.

On the other hand, English stands out as the topic requiring the least amount of study time, making up just 7.1% of the total study time, or 14.10 hours over two weeks. It could be ascribed to a variety of reasons. Firstly, compared to other subjects, English is less complex or challenging. Students could spend less time studying since they feel more comfortable with their linguistic abilities. The academic focus of the group members may have been primarily on topics linked to their data analytics program, which resulted in a relative lack of time spent on topics like English.

The unique dynamics and priorities of the group members also influence the allocation of study time among various disciplines. Students may allocate their study time differently depending on various factors, including personal interests, strengths, and course requirements.



The unique dynamics and priorities of the group members also influence the allocation of study time among various disciplines. Students may allocate their study time differently depending on various factors, including personal interests, strengths, and course requirements.

In this story, users will look at how students study various subjects using two types of study material: lecture notes and the tools that data analytics students frequently use. The visualization displays the differences between these two learning materials.

It shows that studying lecture notes took the most time, with 25.50 hours recorded in 2 weeks, especially for Operational Research. Because Operational Research needs a lot of focus and understanding, students often turn to lecture notes when studying the subject. They spend much time reading the lecture notes to acquire and fully understand the contents effectively.

In contrast, students use data visualization software like Tableau to improve their skills. These technologies enable them to more actively and effectively visualize and analyze data. Hence, they invest time in becoming skilled with these tools, which makes them better at data visualization. There are reasons why Data Visualization was recorded as the subject which required most of the study time (21.10 hours).

Additionally, students studied English for the shortest period than they did compare to other subjects, where only 4.50 hours were recorded in total time taken for study. This suggests that studying English requires fewer lecture notes or specialized tools. Students studying English don't need to use lecture notes and tools as regularly as those studying courses like programming and data visualization, as English is less complex or challenging than other subjects.

Users may compare the visualization with other study materials by selecting the filter next to it. Users can better understand how students approach their studies in various fields. The arrow button will return users to the homepage when they click it. When users click the arrow button, it's like starting over and allowing them to choose what to do next or move around according to their preferences.

With a focus on the effectiveness of study time and study breaks while utilising various study methods, including group study and individual study, we can spot intriguing trends among various subjects by examining study time, and study breaks dependent on the study technique.

Programming Technique stands out as the subject with the most study time and study breaks regarding group study methodology. The fact that students spent 1680 minutes studying this topic in groups shows the importance of teamwork and in-depth conversations. Programming Technique most likely calls for problem-solving and brainstorming, which are best assisted by group interactions. P pupils achieve academic success.

However, English shows the lowest effectiveness of study time when it comes to group study methods. Only 210 minutes were used for group English study, and 30 minutes were used for study breaks. This might be explained by the subject's nature, which often calls for improving each student's reading, understanding, and language skills. Compared to topics that need a greater technical or conceptual understanding, group conversations have little effect on developing English language proficiency.

When we switch to the individual study method, we discover that Operational Research had the most study breaks and time spent studying. With 272 minutes set out for study breaks, students spent 1344 minutes working alone on this assignment. Complex problem-solving and analytical abilities, which frequently call for individualized focus and concentration for effective learning, are probably involved in operational research.

Interestingly, even with the individual study method, English continues to have the lowest study time efficiency. Individual English study time for each student was 636 minutes, with study breaks totalling 71 minutes. Nevertheless, it emphasizes how critical it is to locate efficient study methods and materials designed especially for learning the English language.

This story highlights the importance of study habits and preferences in maximising learning outcomes through analysing the differences of group study and individual study techniques.

The linear trend model may explain 38.4% of the variance in the size of study intervals, according to our analysis of the group study method with an R-squared value of 0.38382. This suggests the group study technique's a relatively predictable relationship between study time and breaks. The length of study breaks among UMP students is considerably influenced by group study, as indicated by the R-squared value of 0.38382. This shows that a significant portion of the variation in the length of study breaks during group study sessions can be attributable to the amount of study time spent.

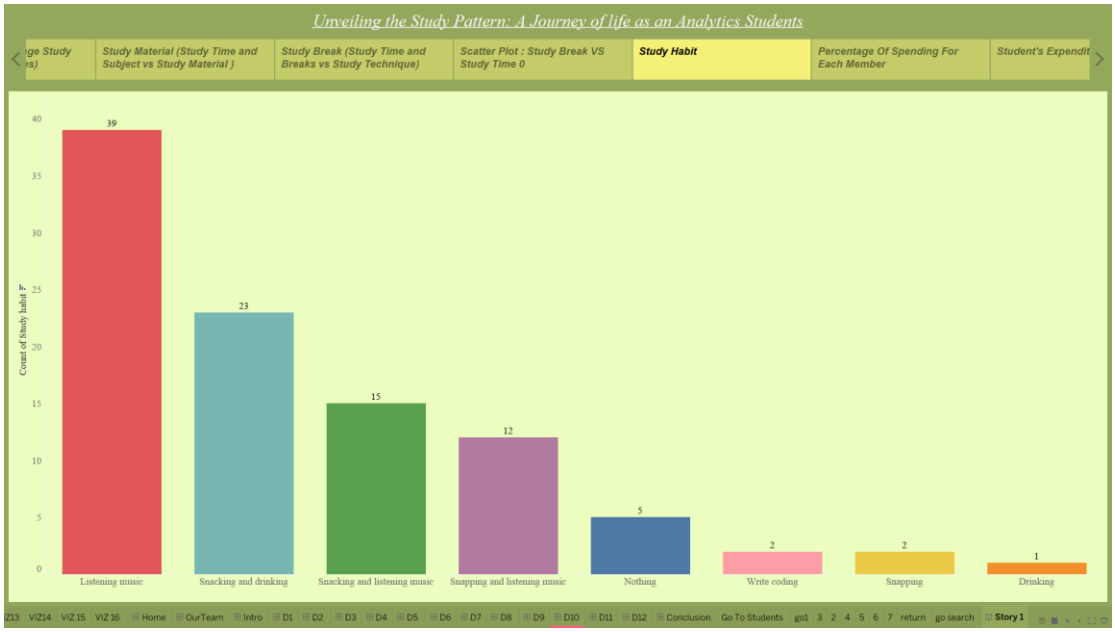
On the other hand, the association between study time and study breaks may not be statistically significant at the usual significance threshold of $p = 0.05$, according to the p-value of 0.311386 for individual study strategies. This shows that the individual study strategy may not significantly influence the length of study breaks among UMP students.

The study technique component does not appear to be statistically significant in the ANOVA table (p-value = 0.808453), suggesting that it might not substantially impact the length of study breaks.

The amount of study time significantly impacts the length of study breaks for both groups, as shown by the significant p-values for both the "Group" and "Individual" categories ($p<0.0001$) when we look at the individual trend lines. The length of study breaks increases by roughly 0.21 minutes for the "Group" trend line and 0.19 minutes for the "Individual" trend line for every additional minute of study time, according to the respective coefficients for the "Group" and "Individual" trend lines of 0.210082 and 0.191608, respectively.

The intercept terms for the "Group" trend line and the "Individual" trend line, which reflect the length of study breaks when the study time is zero, are -8.15916 and -4.29673, respectively. These intercepts are not statistically significant.

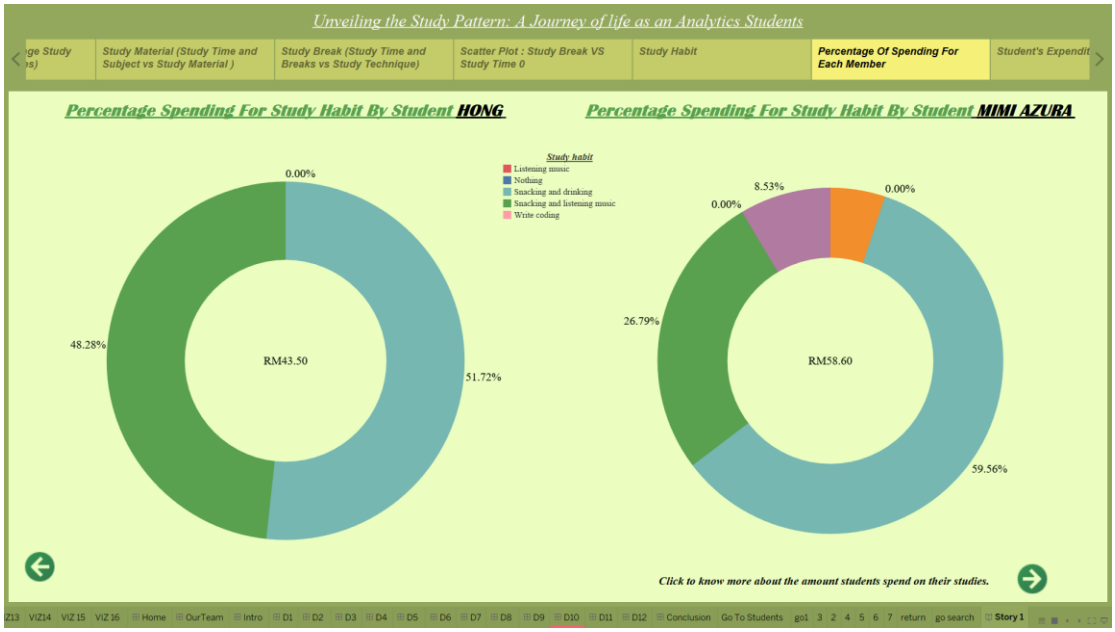
In conclusion, the data demonstrate that the amount of study time strongly affects the length of study breaks, regardless of whether UMP students' study alone or in groups. However, the study technique only significantly impacts the length of study breaks. These findings imply that students take longer breaks as they study more, perhaps to unwind and recharge.



This visualization illustrates the study habits of students. We have identified a few study habits that students always do. Some study habits are listening to music, snacking and drinking, snacking and listening to music, snapping and listening to music, snapping, drinking, writing, coding, or doing nothing. These are some of the habits that the students do when they are studying.

For this study habit, we use a Bar Chart to determine what type of study habit people usually do. From this Bar Chart, we can see that listening to music has the highest number that students always do with 39 times for the overall study session for the past 2 weeks. It is the second highest for snacking and drinking, with a count of 23 times. However, drinking has the least count compared to other habits, with 1 time for all students for the past 2 weeks.

So, students prefer to listen to music when studying. This could make them more focused when studying. Sometimes the noise from their surroundings can distract them when studying, so by listening to music, they can cut off the distraction and concentrate.



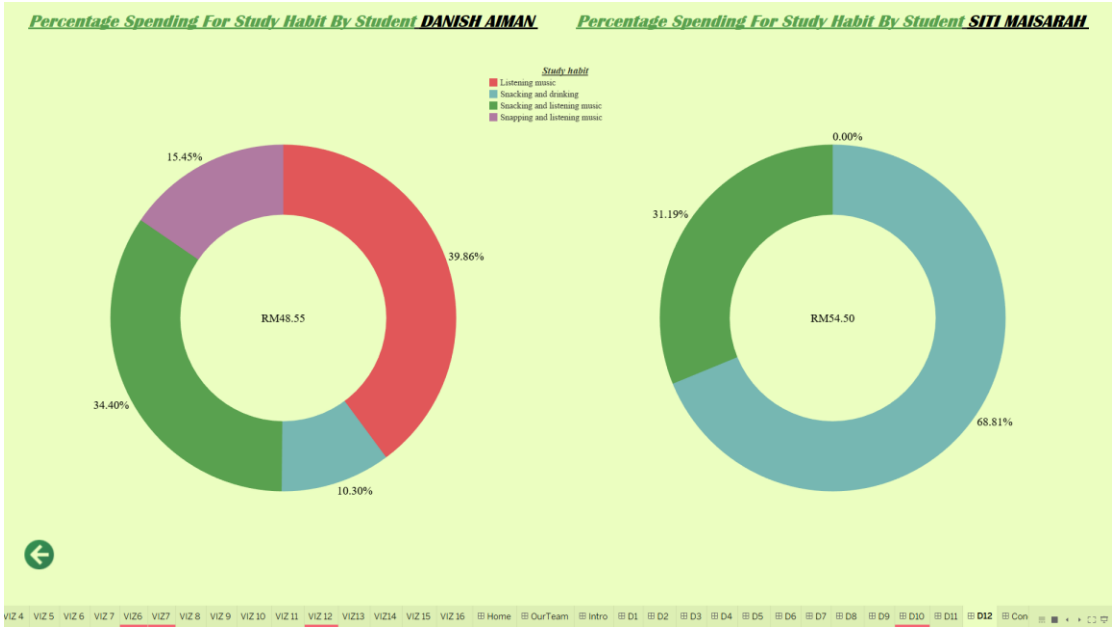
This part displays a visualisation that illustrates the percentage of time that two students, Hong and Mimi, spent engaging in various study habits. Overall, it is clear that these two students have different patterns of study habits. Mimi has more of a study habit than Hong based on the graph above.

Eating and drinking take up a sizeable percentage of study time for both students. Compared to Mimi, who spends 59.56% of her study time eating and drinking, Hong engages in this practice at 51.72%. This shows that both students find it advantageous to eat and drink something while studying because it may assist them in staying alert and maintaining their energy levels. They may believe eating, and drinking will help them stay attentive and active while studying.

Mimi stands out in terms of spending on study habits because she does so more frequently than Hong. Hong spent RM 43.50 on study habits throughout the two weeks, compared to Mimi's total cost of RM 58.60. This shows that Mimi is more inclined to spend money on tools or supplies to improve her learning and studying. She might prioritize investing in books, teaching aids, or other supplies that she thinks will help her academic performance.

When prioritizing their study habits, Hong and Mimi have different preferences and priorities, which may be shown in their divergent spending patterns. Although both students tend to eat and drink during class, Mimi is more willing to invest money in improving her learning environment. This indicates that Mimi actively seeks ways to improve her learning process and values the possible advantages of spending on study-related products.

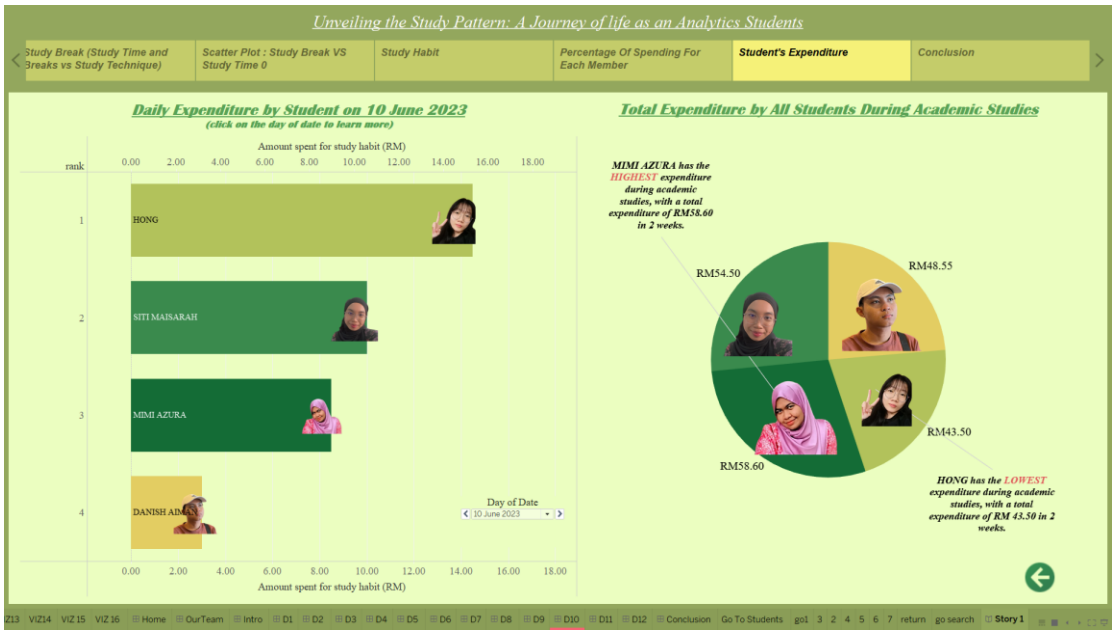
Overall, the data shows that both students know how important study habits are and how they affect academic success. While they both eat and drink during study sessions, Mimi spends more time on her study habits, indicating a stronger propensity to seek out resources to enhance her study experience actively. To establish the best learning environment, students can identify efficient study techniques and use their resources effectively by being aware of their preferences.



In this visualisation, there is a comparison of percentage for study habits by 2 students which are Danish and Mai. Overall, both students have different patterns of study habits with Danish having more study habits than Mai.

Maisarah studies mostly when eating and drinking, which accounts for half of her whole study routine, which is 68.81%. She appears to really like having food and drinks as she studies to keep her motivated and focused. Danish, on the other hand, only consumes snacks and beverages during a small portion of his study period, roughly 10%. He doesn't appear to spend a lot of time on snacks and beverages, preferring to focus more on his actual studies.

Danish prefers to listen to music as his study habit since this study habit already occupy 39.86% from his overall study habit. He can focus more effectively on his studies by creating a comfortable and soothing environment with the help of music. Danish uses music to help him relax and focus when studying. Everyone finds the ideal environment for learning in their own unique ways. It's interesting to observe how every individual has study habits that suit them best.



In this visualization, we will compare each student's daily expenditure and total expenditure. From this, we can identify how much they spent during their academic studies in the past 2 weeks. So, we use a running bar chart for the daily expenditure since the first day of our data-collecting period. However, for the total expenditure for the past 2 weeks, we used Pie Chart to categorize and identify who spent the most during their academic studies.

For the daily expenditure, you can make it run by pressing the play button. This will show the day's ranking from day 1 until day 14. From that, we can easily identify who spends the most and the least during that day. Our studies show that on day 14, 12 June 2023, Mimi is currently at number 1, followed by Hong, Danish, and Maisarah. Mimi spent RM7.60, and Maisarah spent RM2.50 on that day. The difference in spending between the highest and the lowest is RM5.10.

For the Total Expenditure for the past 2 weeks, we can see that Mimi spent the most, followed by Maisarah, Danish, and Hong. Mimi spent RM58.60, and Hong spent RM43.50 for the past 2 weeks. The range of students' spending is between RM43.00 to RM59.00. This is quite a lot of spending, considering they are students.

From this comparison, we can see that students spent a lot on their academic studies for the past 2 weeks, so maybe any parties that may be concerned need to take the initiative to lessen the price for the students to help them financially and lessen the total spent by them.

4.0 CONCLUSION

In conclusion, the UMP students' study schedules are crucial to their academic success. The study habits of UMP students enrolled in the same course or faculty were investigated and analysed for this group project using a wide range of data categories. Collecting information over two weeks taught us crucial aspects of their study schedules, including study locations, topics, approaches, methods, materials, routines, and lengths. The outcomes of this assignment can be utilized to comprehend students' learning preferences and identify areas for development.

Based on the visualizations, the room is the preferred study place at UMP, as it promotes concentration and productivity. The least-frequented study places on weekends include the library, cafe, and amphitheatre, suggesting that students prefer to study in their dorms. Most students choose private study, according to the examination of study methods by subject, except for the programming technique course, which necessitates group brainstorming and discussions. Memorization is the least preferred study technique, while exercise is the most popular.

Additionally, we observed that while the individual study was preferable for most other subjects, group study was favoured for programming technique. This highlights the collaborative character of the subject and the need for discussion and brainstorming.

Furthermore, according to our data, UMP students employed a variety of study tools, such as lecture notes, eBooks, educational apps, and online courses. Notably, during study sessions, students regularly engaged in activities like snacking and listening to music.

Understanding effective study techniques and dealing with potential issues can help UMP students be more productive, organize their study time better, and achieve better academic achievements. The results of this assignment should contribute to developing interventions and support systems specifically intended to aid UMP students.

Last but not least, an action feature called "GoToURL" is embedded in this visualization using Tableau. Users can click on the "Search" icon to redirect them to a video about "A Day as Analytics Students."

Overall, the visualizations offer a thorough perspective of students' daily spending habits. This facilitates analysis and decision-making about financial support and student welfare.