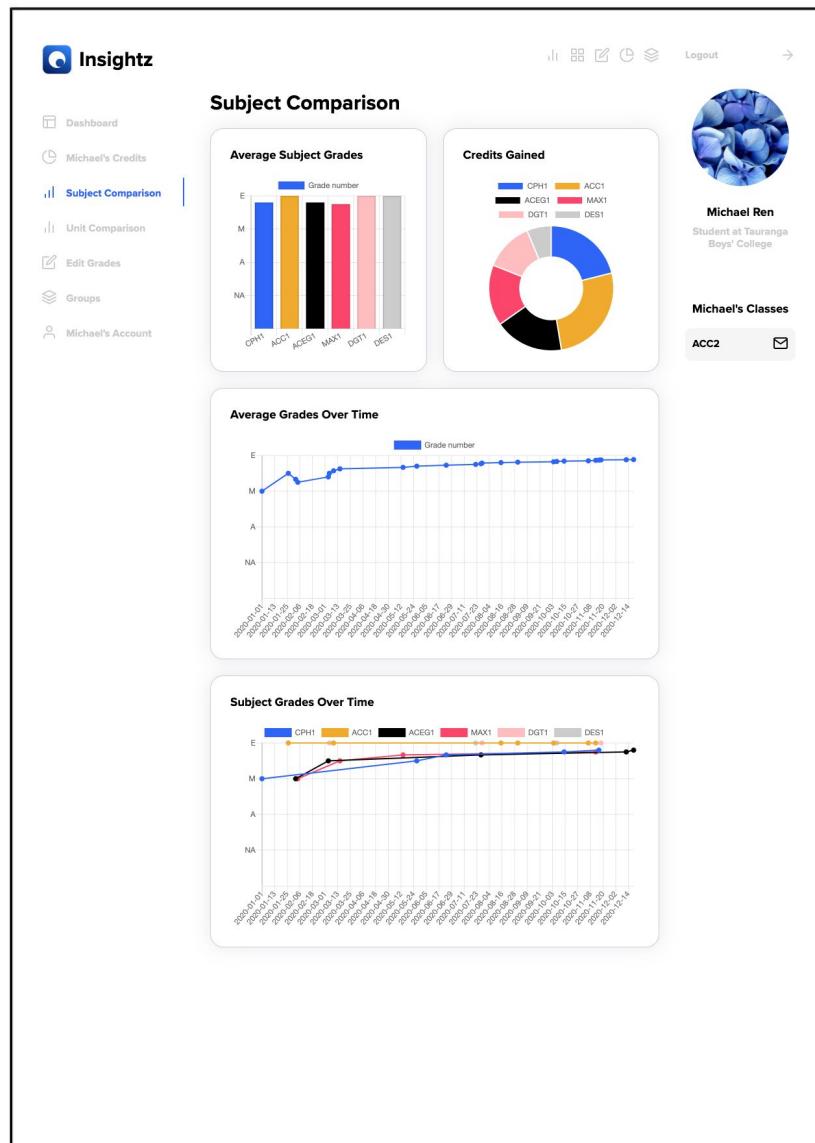




Summarise your idea using our 'fill in the blanks' template below and a visual which reflects your project.



MY INNOVATION IS CALLED Insightz (<https://insightz.app>)

MY NAME / TEAM NAME IS Michael Ren

I / WE GO TO SCHOOL AT Tauranga Boys' College

MY / OUR BIG IDEA IS A web-based data visualisation tool that converts grades into easy to understand graphs.

AND IT HELPS Students, parents and teachers who don't have an in-depth understanding of their academic progress.

BY SOLVING THE PROBLEM OF Not being able to have a thorough understanding of their academic results when its displayed in boring, plain text tables.



## THE PROBLEM

Communicate the problem you are trying to solve, how big it is, who it affects and why it matters.

2

### What problem am I trying to solve?

The problem I am trying to solve is that students and parents do not have an in-depth understanding of their / their children's academic results. I came across this issue because my parents found it difficult to understand NCEA and needed explanations when viewing my results. The data provided by schools, such as the NCEA summary page, are informative but have many disadvantages because students' academic results are mainly displayed in a table format. The Kamar student portal, for example, only shows a snapshot of students' academic results. What if you want to see how much you have progressed since the beginning of this year? Or want to know what subject needs the most improvement? Since most people are visual learners, it is often difficult for us to comprehend a large amount of data numerically. Therefore many parents also struggle to gain a solid understand of their children's academic results.

### Who is affected?

Most secondary school students in New Zealand can be affected because they use Kamar or the NZQA website to check their grades. Both platforms mainly display grade data using plain text tables which can be difficult to understand. However, parents are the most affected because they may not be familiar with NCEA. Also, if their children don't talk about what happens at school, then these parents won't have any idea of how their children are progressing through the year.

### How does my innovation solve this problem?

Humans are best at processing data visually. When trying to make sense of quantitative data such as  $\frac{3}{4}$ , it's often easier to view the data in more visual formats such as slices of a pizza. Similarly, Insightz solves this problem by converting students' grade data into comprehensive and easy-to-understand graphs. This provides users with detailed analyses and a wide range of comparisons of their academic results which helps students and parents to gain deeper insights into their academic performance and track their goals.

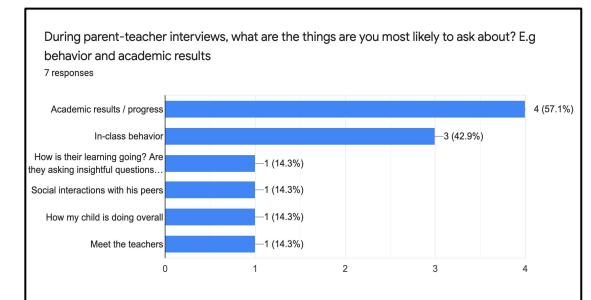
### Why it matters?

Education is a crucial part of our lives. Many parents want to engage in their children's learning, but often get tangled up in a web of confusion when trying to understand their academic results. This problem can quickly escalate in bigger families as parents have to track the academic progress of multiple children. This is a serious issue because if parents do not know how their children are progressing through the year, it will be difficult for parents to help them improve academically or communicate with them about things happening at school. In addition, if students themselves do not have an in-depth understanding of their academic performance, such as what subject needs improvement, they may not know when to seek guidance or manage their time efficiently to achieve their goals. This can have big impacts on students' future e.g they may not have enough UE credits to attend university.

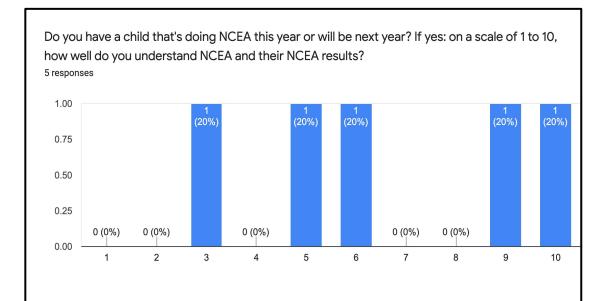
### How big is this issue?

To understand the scale of this issue, I interviewed Mrs. Roff - the director of the International department at Tauranga Boys' College and Korean Times - a Korean agency for international students in Tauranga. They both agreed that many international and New Zealand parents struggle to understand their children's academic results due to the complexity of the NCEA system. Korean Times said that many international parents only know about Not achieved, Achieved, Merit, and Excellence credits, but not other aspects of NCEA such as the number of credits required for subject endorsements. Therefore, they often need explanations and an overall summary from their agents when reading school reports.

I have also surveyed some parents to get a clearer understanding of this issue. Out of 1 to 10, the average response for how well they understand NCEA and their children's NCEA results is 6.6. This proves that some parents don't have a strong understanding of their children's grades. However, does it matter? Do parents want to care about their children's academic progress? Well, the answer is yes. In the survey, I have also asked the participants what questions they are most likely to ask during parent-teacher interviews. The most voted response was "Academic results/progress" which confirms that parents are indeed interested in having a better understanding of their children's academic progress.



After researching, I found that many parents care about their children's academic progress but don't have a solid understanding of NCEA and their academic results because the current ways of display grade data are difficult to understand. Based on [NZQA's 2020 annual report](#), there were 163,936 domestic students, 14,349 international students, and 3,703 adult students enrolled in years 11 to 13. To conclude, this is an issue that cannot be understated.





## YOUR RESEARCH

Communicate who your innovation is for, what they need, who you spoke to when carrying out your research and what technology or science you might use to make your innovation work.

# 3

### Market Demand:

During my market research, I asked students and parents whether they think graphs are easier to understand compared to plain text tables. The majority of the participants agree that graphs, such as the pie chart available on the Kamar student portal, give them a clearer understanding of their academic results. As a result, they would like to have more graphs or similar visualizations when viewing their academic results for in-depth comparisons and analysis.

One parent I interviewed said that his understanding of the NCEA system is 5 on a scale of 1 to 10, because "it's quite different to what I was doing". He also said that graphs are better because they are more visual, therefore they are especially useful when taking a quick look at their children's grades.

In an interview with Mrs. Roff, the director of the International department at TBC, she said not only are NCEA results hard to understand for international parents, but they can also be confusing for some New Zealand parents. Many students themselves don't even have a good understanding of their own academic progress. Therefore, she thinks Insightz would be a very useful tool for students and parents and see a demand in NZ schools because it can help students improve academically and help parents be more engaged in their children's learning.

A friend of mine who is also doing NCEA level 2 said that a clean and modern user interface is very important to students as "subconsciously they (students) are gonna feel happier and more relieved". In contrast, a bad user interface can make students feel unproductive and less motivated. After demonstrating Insightz, he said, "It's just such a perfect application for students, instead of getting overwhelmed by trying to track their grades on Kamar and follow up with teachers." He thinks this innovation would be helpful to any secondary school students, even outside of NZ, and also sees a demand amongst university students because they are more academic and lack the time to manually track their grades.

In my survey, I also asked parents "do you think having a better understanding of your children's academic results would allow you to offer more guidance and help them improve?". As expected, 85.7% of the participants responded "yes". Combined with the research in slide 1 (showing that many parents don't have a strong understanding of their children's academic results), these responses indicate a strong demand for my innovation because it allows parents to understand their children's academic results with ease which means they can be part of their children's learning.

### My target users and what they need:

My target users are mainly students who are studying NCEA / Cambridge system and their parents. However, teachers would also be able to use this web application to view the collective grades of a class and track students' academic progress. To learn more about what my target users need, I surveyed my friends, some parents and interviewed Mrs. Roff, and Korean Times. They gave me a few suggestions of functionalities that should be available on Insightz.

Firstly, there should be a section that explains how NCEA works because parents need some basic understanding of the NCEA system before they can interpret the graphs of their children's results. For example, the page should include: what are internals and externals? How many credits are needed to pass NCEA? what are UE credits? .etc.

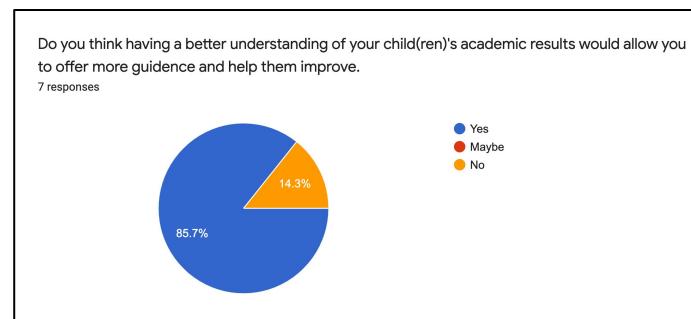
Secondly, each graph should have a detailed explanation of what it shows, how to interpret it, and what it looks like in different scenarios. Using the overall average grade (time-series) chart as an example: "If the student has improved and achieved higher marks since the beginning of this year, then the blue line would move up towards the letter E." This feature will help parents and students to understand their results more accurately.

Although the current minimum viable product (MVP) is quite easy to use, as more features are added, I will need to implement a step-by-step tutorial that teaches the users how to understand the graphs and use each feature. Currently, there isn't any usage instruction such as how to import their existing grades or join a class. In addition, I plan to include randomly generated demo data for users to play around with which will help them use this platform more effectively.

Fourthly, I plan to add a goal tracking system where students can set their goals, then receive weekly updates about how they are progress towards their goals and what they should do to improve and reach their goals. For example, if a student wants to endorse all subjects with excellence, Insightz would compare their current number of excellence credits to the total number of excellence credits needed for overall endorsement. Based on this information, Insightz would generate a report and send a notification to the student before their next assessment about what grade they should aim for in order to achieve the goal of excellence endorsement.

Korean Times said since many international parents are unfamiliar with NCEA, they often need verbal explanations to understand school reports and results. Therefore, I plan to include a monthly summary feature where Insightz would generate a report for students and parents about information such as: how much they have improved compared to the beginning of the year, how many more credits are needed to pass this year, how close is the student from completing their goals and any subjects that needs work on .etc. With this feature, Insightz would also alert students and their parents if may not be able to pass a particular subject. This will help them to manage their learning more efficiently and parents would also be able to support their children academically.

After talking with a friend's Dad, he recommends adding a teacher comment section on Insightz. Instead of waiting for reports which are released once per term, this would allow parents to hear from the teachers more often and gain a better understanding of their children's school progress.



## YOUR RESEARCH

Communicate who your innovation is for, what they need, who you spoke to when carrying out your research and what technology or science you might use to make your innovation work.

# 3



### Existing Solutions:

After researching for similar grade visualization software, I have found nine existing products: Assay, Kamar, Career Central, NZQA, NCEA Pal (Discontinued), NCEA Student (Discontinued), Tracelt, NCEA Track, and NCEA Results Tracker. However, these websites/apps have many disadvantages and do not solve the problem of students and their parents not being able to understand their academic results.



Firstly, many existing products lack visualizations features such as grade comparisons between subjects or graphs that show how students are progressing throughout the year (i.e. have they improved?). This means that users are not gain a better understanding of their academic progress. For example, Kamar only has one pie chart available to students (shows how many credits a student has gained at each level), and the NCEA Results Tracker app only has a few progress bars to track students' overall progress to endorsing their year level.



Secondly, some products are only available to specific users groups. For example, Assay is made just for teachers, most of the graphs on Kamar are only accessible by teachers, and Career Central only works with students enrolled in selected schools. This means that many students and parents do not have access to software that can provide them with useful insights into their academic performance.



Thirdly, products such as the NCEA Results Tracker app require users to add all their grade entries manually while the others such as NZQA automatically import students' grade data from their databases. However, there are downsides to both types of systems. If students need to enter their grades manually, it can be inconvenient especially near the end of the year as they will need to have many results. Therefore, students might give up and not use the software. On the other hand, if students' grade data can only be imported from SMS (School Management Software such as Kamar), then the graphs generated could be outdated because teachers may not immediately post students' grades to their SMS after marking their assessments.



Lastly, many existing products lack a well-designed user interface and feel outdated. This can put students off from using it and disrupt their learning experience, causing them to feel unproductive and less motivated.

### How my innovation stands out:

Insightz is different from the existing solutions in five main ways:

- **Portability** - Since it is a web application, it can be accessed from any device worldwide with an active internet connection. No download means it won't affect your device storage, new features can also be quickly added / easily updated. It's available for both students and teachers.
- **Easy of use** - From my surveys and customer research, all participants have agreed that the web app needs to be convenient and effortless to use. Insightz should lift weights off the users' shoulders, instead of creating more issues and increasing workload for students. The app features a clean and minimalistic user interface which means a smaller learning curve and users can easily navigate through the app to maximize efficiency.
- **Ad-free** - I believe that any educational tool should not include any advertisements which can disrupt the learning experience and distract students from their work.
- **Lightweight but powerful** - Currently, Insightz works with both NCEA (NA, A, M, E) and Cambridge / US grading system (A, B, C). Students can import their existing grades from the table on the NCEA Summary page on their student portal, or add them manually as the year progresses. They can also export their grades from Insightz as JSON files and import them back later. Insightz is lightweight and does not rely on other educational software to function, therefore, it can be used by schools, individual and external tutoring centers.
- **Goal tracking and monthly summaries** - Insightz will allow students to set their goals and notifies them before upcoming assessments about the grade they should be aiming to achieve. Also, monthly reports will be generated which summarises students improvements, any declines in their results, and how they are progressing towards their goals. This allows students to gain a better understanding of their academic performance which can motivate them to work harder.



Communicate who your innovation is for, what they need, who you spoke to when carrying out your research and what technology or science you might use to make your innovation work.

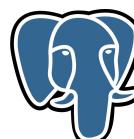
\* Server image is from Treton Systems <https://www.trentonsystems.com/blog/what-is-a-rack-server>, Macbook image is from Apple Inc <https://www.apple.com/nz/shop/buy-mac/macbook-pro/13-inch>

## Technology Required:



The technology I used to develop Insightz are:

- Django - a Python web development framework. It handles the backend processes such as user authentication, communication with the database, file upload, and GPA calculations .etc.
- Chart JS - a Javascript library that allows you to create responsive and customizable graphs.
- PostgreSQL - a database management system to store user information
- A server to host the website
- A laptop for UI design and programming
- Any device with a modern web browser and an internet connection to display the website



## Cost of Insightz:

The cost of developing the MVP is free since I do all the programming and UI design myself. However, the production costs can be high. The domain name [insightz.app](https://insightz.app) costs about \$17 USD to renew and the current server hosting costs \$120 USD to renew. In total, the annual recurring cost of this project is around \$137 USD. This figure will increase as the number of users increases because more storage, bandwidth, and processing power will be required. The web font that's currently used is Proxima Nova which is included in my Adobe Creative Cloud subscription. However, after my subscription ends, each font style will cost \$30 USD.

## Sustainability:

Since Insightz is a software-based innovation, running this project doesn't have a direct environmental impact as it can be hosted on any server and can be easily delivered to users without producing waste products. However, generating electricity based on non-renewable energy sources such as natural gases and fossil fuels will produce greenhouse gases and other by-products which can be harmful to the environment. According to [this article](#) on BBC, Mike Hazas, a researcher at Lancaster University says "The carbon footprint of our gadgets, the internet and the systems supporting them account for about 3.7% of global greenhouse emissions ... And these emissions are predicted to double by 2025." The exact environmental impacts of this innovation are difficult to measure because there are so many uncontrollable variables and processes to consider such as the manufacturing of electronic devices, power generation, and e-waste recycling. Technology is also rapidly advancing as the world transitions to cleaner solutions. Overall, Insightz has no effects on the environment because it only occupies a tiny fraction of the global internet infrastructure.

Insightz can also impact the environment positively by helping to reduce paper waste because it allows students and parents to access academic reports and view their grades digitally. This reduces the amount of paper used by schools to print student reports during parent-teacher conferences. However, the amount of paper that can be saved is difficult to measure because it depends on the number of students, courses available, and many other factors.

The impact of Insightz on end-users is positive as it allows students to better understand their academic progress and encourages them to work harder and manage their time more efficiently. Insightz can also increase the communication between parents and their children which provides them the opportunity to engage in their children's learning and offer more guidance to help them improve.



Explain your final idea, how it works and how it solves a problem.

Average subject grade comparison

## The Final Product:

My final product - Insightz <https://insightz.app> is a web-based data visualization software that solves the problem of students and parents not having an in-depth understanding of their / their children's academic results. It does this by converting grade data into easy-to-understand and informative graphs. Since humans are great at processing visual information, academic results are easier to understand when displayed in graphs compared to plain-text tables which allow users to gain a more comprehensive understanding of their academic progress. My target customers are mainly high school students, however, parents and teachers can also use it. Insightz can be accessed on any modern device anywhere in the world using a web browser which allows students to use with easy both at school and home.

Currently, Insightz offers two types of accounts, teacher and student accounts. In the student panel, users can import existing grades from their student portal or add them manually as the year progresses. The grade data are then processed and converted into graphs and split into three sections: My Credits, Subject Comparison, and Unit Comparison.

On the My Credit page, you can compare how many credits of each level you have gained in your subjects. Using the pie chart, you can also see the total number of credits you have gained at each NA, A, M, E level.

On the Subject Comparison page, you can compare the average grades of each subject. This informs students of what subjects need improvements so they can use their time more wisely. There is also a pie chart that shows you the total number of credits you have gained in each subject. Scrolling downwards reveals two time-series charts. The first shows how your average grade changes throughout the year, whether you have improved or not. The second allows you to compare the change in your average grade in each subject. This provides a more in-depth understanding of what areas have improved and what areas need more work on.

On the Unit Comparison page, the first time series chart shows you how your assessment results change throughout the year. You can also choose a specific subject and view detailed information such as how many credits you have gained in that subject, how your assessment results in that subject change throughout the year, and how many credits of what level you have gained for each assessment.

Teacher accounts come with additional features. They can create classes each assigned with a join code. Students can then join classes by entering the join code under the Groups section in the student dashboard. After joining a class, teachers will have access to students' dashboards. When viewing the academic performance of a class, teachers can: compare the class's average grade to the school's average grade (of the same year level), view how the class's average grade changes throughout the year, and compare the number of students who have got N, A, M, E for issued assessment .etc. They can also view a list of students enrolled in a selected class or subject which is ordered based on their GPA of the course.

4

Editing grade entries

Account settings

Visualizing the avg grade of a class

Student ranking within a class

