



NOVUS: IMPROVING DATA-BASED INSTRUCTION AT CLASSICAL

I. Introduction

In today's data-driven world, many businesses are faced with deciding whether to build their own data system, buy one, or use a hybrid of both. While many factors are considered, the decision is generally based on business goals, operational processes, and available resources. For example, a business may choose to custom-build a solution based on their specific onboarding process that connects their out-of-the box recruitment software to staff evaluation data.

In K-12 education, very few school districts build data platforms as there are many student information and learning management systems for schools to choose from. This leaves schools that operate using a unique structure or curriculum without a system that reflects their model and/or the technical staff to modify their system to match their needs. A study in 2016 found that on average, school districts use anywhere from 3-7 different systems with 60% of this data never making it to the classroom. The same study found that 67% of teachers feel that the data provided to them is not detailed enough.

In the fall of 2017, Classical Charter Schools (CCS) began using Microsoft BI tools and building custom software to create a system that matched our curriculum. Meticulous data collection and analysis has always been key to CCS's success and is unique in that it has always been fueled by teacher inquiry and has created a school culture that values data as a tool to create a highly individualized education for all scholars. As our network grows, Classical's focus is on taking teacher best practices around data tracking to create a system that can both be flexible and specific enough for daily teacher use as well as provide real time analysis for our Instructional Coaches (ICs) and school leadership. This process automated analyses that our teachers had been performing manually and made data entry more efficient and accurate.

In the Fall of 2019, Novus and an in-house dashboard system were rolled-out to staff. Not only has Novus standardized and improved the usability of our data, but it also saves our teachers approximately 1,540 hours a year in grading and 173 hours a year in analysis.

Harder to quantify is the added analyses that our teachers, ICs, and curriculum developers now have, such as looking at standard performance across tests and even grades.

II. Novus

Novus is a proprietary application created by our data team at Classical that allows teachers to get real time analysis on how their scholars perform on each question, standard, or question type of a test,

allowing us to create a truly individualized education for all of our scholars. Novus saves our teachers at Classical 173 hours a year in time spent on data analysis. Novus also provides our ICs with data-based insights from which they can make informed coaching decisions.

In developing Novus, it was important to create a more efficient, robust version without losing the key insights and flexibility of tracking that our teachers rely on to make important instructional decisions. Classical needed a data solution that matched the specificity and flexibility of a teacher-developed data system but allowed for deeper analysis across our network. Our approach to creating Novus can be explained through the following core elements:

1. Specificity- provide instructional insights that can drill down into specifics of what each scholar answers on each question to each test
2. Speed- deliver real-time analysis in order to make the most use of each instructional minute
3. Interoperability- connect to other Classical systems used to track staff development, scholar demographics, and operations platforms
4. Flexibility- update analyses and methods of data entry to keep up with research and educational best practices

1. Specificity- the Analysis section of Novus is built to be able to view test content by various groupings. The type of test content that is tracked includes: each specific question, the type of question (for example multiple choice vs. short response), and a specific common core standard (such as adding or subtracting fractions). Test content can be rolled up to see how each school has performed across years as well as how each class, small instructional group, and individual scholar performed.

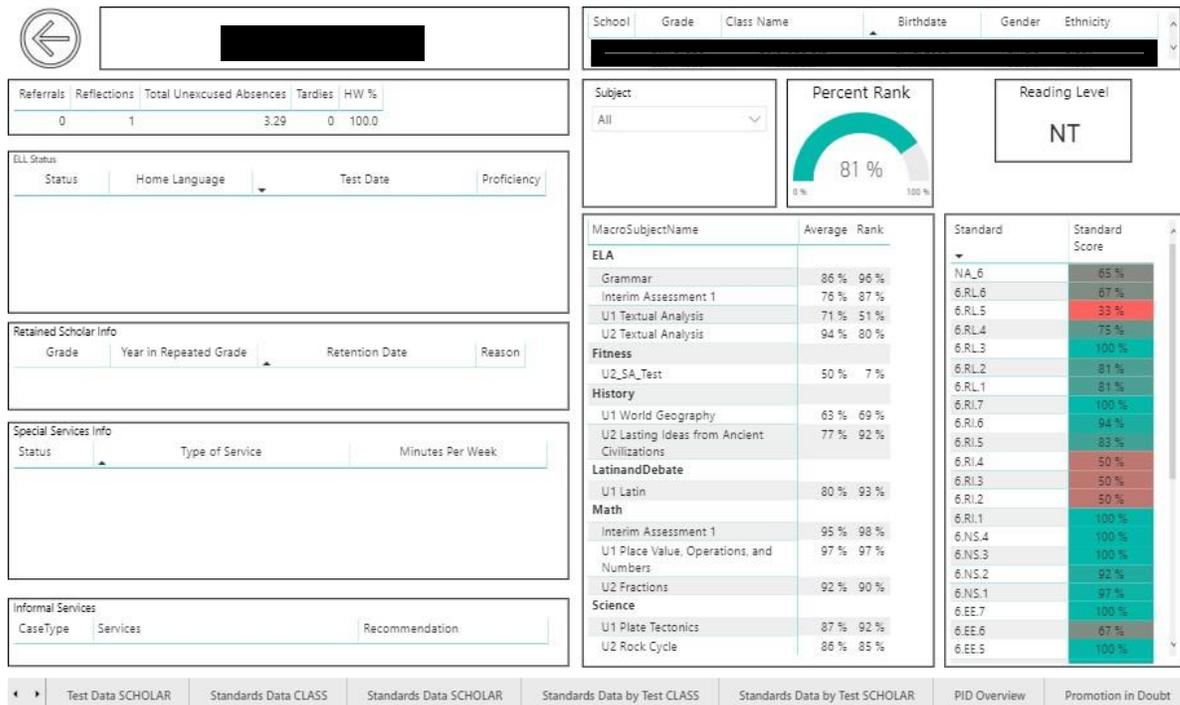
Class / Scholar	Question	Question Type	Answer / Points	Standard	Average
Network Avg : 65.6%	1	MC	C / 1	4.RI.1	83.3%
	2	MC	A / 1	4.RI.1	C
	3	MC	D / 1	4.RI.1	D
	4	MC	A / 1	4.RI.3	B
	5	MC	C / 1	4.RI.3	C
	6	MC	C / 1	4.RI.1	B
	7A	SR	1 / 1	4.RI.1	1
	7B	SR	1 / 1	4.RI.1	1
	8A	SR	1 / 1	4.RI.1	1
	8B	SR	1 / 1	4.RI.3	1
	9	MC	C / 1	4.RL.3	C
	10	MC	A / 1	4.RL.3	A
	11	MC	B / 1	4.RL.1	B
	12	MC	D / 1	4.RL.3	D
	13	MC	C / 1	4.RL.1	C

Class	Question Types	Average	MC	SR
SBCCS I - SUNY Coble	Weight :	61.7%	61.6%	62.1%
SBCCS II - FIU		66.5%	78.1%	29.7%
SBCCS II - ALL		67.0%	74.3%	43.7%
SBCCS I - TCNJ		67.3%	71.9%	52.8%
SBCCS I - ALL		67.5%	68.6%	64.2%
SBCCS II - Yeshiva		67.5%	70.4%	58.3%
SBCCS III-IV - McGill		71.0%	70.8%	71.5%
SBCCS I - Cornell		72.2%	70.9%	76.3%
SBCCS III-IV - ALL		79.1%	78.9%	79.8%
SBCCS III-IV - UAlbany		79.9%	83.3%	69.2%
SBCCS III-IV - MIC		80.4%	79.2%	84.1%
SBCCS III-IV - RIT		82.3%	82.7%	81.0%
SBCCS III-IV - Charleston		82.9%	78.9%	95.2%

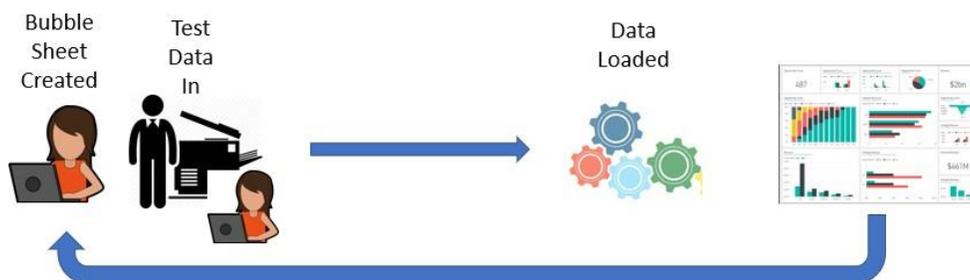
2. Speed- once teachers enter in results on the Novus page, they instantly have the option to view their analysis. Sortable tables allow grade team leaders to quickly see how their classrooms have

performed in various test content areas. With this information in real time, teachers can adjust lesson plans and create purposeful small group instruction to properly give each scholar the instruction they need to be successful.

3. Interoperability- Interoperability refers to the ability for data systems to share information. Because Novus is completely integrated with other software that Classical uses, our staff can refer to dashboards that show test data along with information from a separate system. For example, by going to a scholar snapshot, teachers can see not just how a scholar performed on a specific test, but also see information on their attendance, behavior, and historical academic data while at Classical.



4. Flexibility- because we are committed to always improving data collection and analysis practices, it was important that Novus be proprietary and flexible. Novus was built to allow for data to be entered manually by teachers as well as be populated by bubble sheet scanning software. By utilizing bubble sheet scanning software, our teachers save an additional 30 hours of data entry a year.



III. Novus Implementation

- a. Development & Feedback- In developing Novus, we focused on keeping analysis the same, but improving the data entry process and analysis view to cut down on teacher load. We also considered that keeping the look of Novus as simple and similar to past practices would be beneficial in the roll-out and implementation phases of the process.
- b. Testing- Once a beta version of Novus was available, there was a focus group held at each of our Classical school locations inviting teachers and non-teachers to use and give feedback. This feedback focused on the analysis views, and changes to Novus were made based on the method that our teachers use in their data meetings to create instructional groups. A final version of Novus and the use of Remark bubble sheets for data entry was tested over the summer at our Summer Learning Academy. This allowed leadership to test out the process of creating bubble sheets, get feedback from teachers using the bubble sheets, and test out issues that may arise from populating Novus with data from Remark. Like all construction processes, there is a balance between adding in features and hitting deadlines. To add in features such as editing a test after scores have been entered and connecting staff access to a separate student information system, some data analysis was created using Power BI dashboards. This data analysis features looking at standards over the course of 2 years and a daily updated list of at-risk scholars. Power BI dashboards are embedded in SharePoint.
- c. Roll out- Our teachers were given a 45-minute Professional Development (PD) session on how to use Novus and the data meeting dashboard. Because Novus was very similar to past ways of entering data in look and feel, veteran teachers felt comfortable moving to the new system and easily recognized the benefit of the quick analysis it provided. Our curriculum and coaching team used the system over the summer and created a new data meeting format that capitalized on the new features in both Novus and the Power BI report (called the data meeting dashboard). In the weeks of PD leading up to the start of school, our coaches walked teacher leaders (Grade Team Leaders) through using the system to answer questions and create instructional groups.