

# New York Education System Analysis

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## 1 Problem Statement

New York State Education Department is an entity that looks over the supervision of all public schools in New York. They are also the entity that is responsible for ensuring standardizing testing as well as the production and administration of state tests and Regents Examinations.

GRAD\_RATE\_AND\_OUTCOMES\_2021 gives us information regarding the graduation and dropout data for the state of New York, as well as for the counties necessary to interpret certain downfalls within the system in specific locations post analyzing the correlations between the economically disabled, students suffering from a disability, non-English speaking students and migrant student vs the graduation percentage and the drop rate to deduce necessary inferences and take actions for continuous improvement in the year of 2022 based on performance index of 2021.

The analysis conducted are:

- Enrollment Comparison by County
- School Comparison by highest enrollment
- County Average by Education Matrix
- English vs Non-English Speakers, Statewide
- Migrant vs Non- Migrant by County
- Race Wise - Dropout Rate v Graduation Rate
- Economically v Non-Economically Challenged
- Disability v All
- Male v Female, statewide basis.

## 2 About the dataset

*GRAD\_RATE\_AND\_OUTCOMES\_2021:*

The variables available for analysis are:

- Aggregation\_Index
- Aggregation\_Type
- Aggregation\_Name
- Membership\_Desc
- Subgroup\_Name
- Enroll\_Cnt
- Grad\_Cnt
- Grad\_Pct
- Dropout\_Cnt
- Dropout\_Pct

This database contains annual graduation, and dropout data for the state as well as by county, Need to Resource Capacity group, district, public school, and charter school. Annual graduation data is included for the current four-year cohort (June and August graduates), five-year June and August, and six-year June and August cohorts.

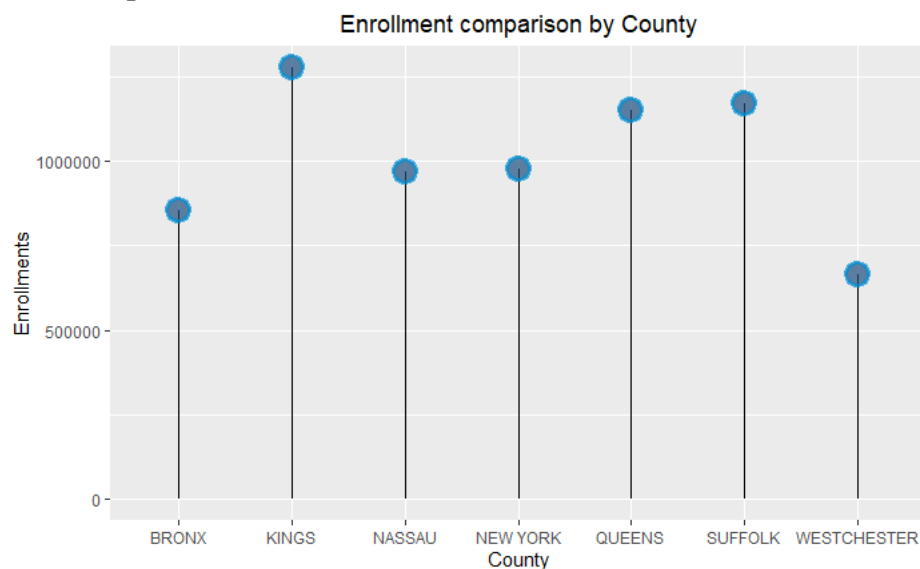
Referred from [Graduation Rate Database](https://data.nysed.gov/downloads.php): <https://data.nysed.gov/downloads.php>

## 3 Output

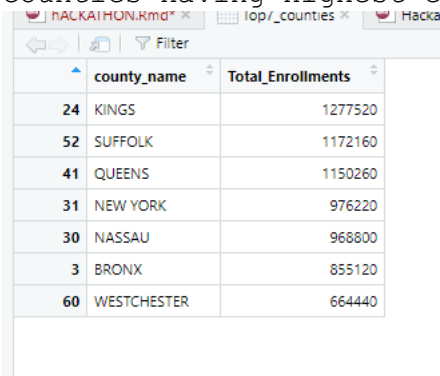
### 3.1 Institution Analysis in 2021

#### Enrollment Comparison by County

The number of enrollments helps us confirm the population index of New York Demographic and ascertain the level of education of the populous in the year 2021.



Post analysis it can be observed that the enrollment is high in Kings County accompanied by Queens County, Suffolk County, and Nassau County among others; matching the New York population index by county inferencing, the counties having the highest population are among the counties having highest enrollment too.

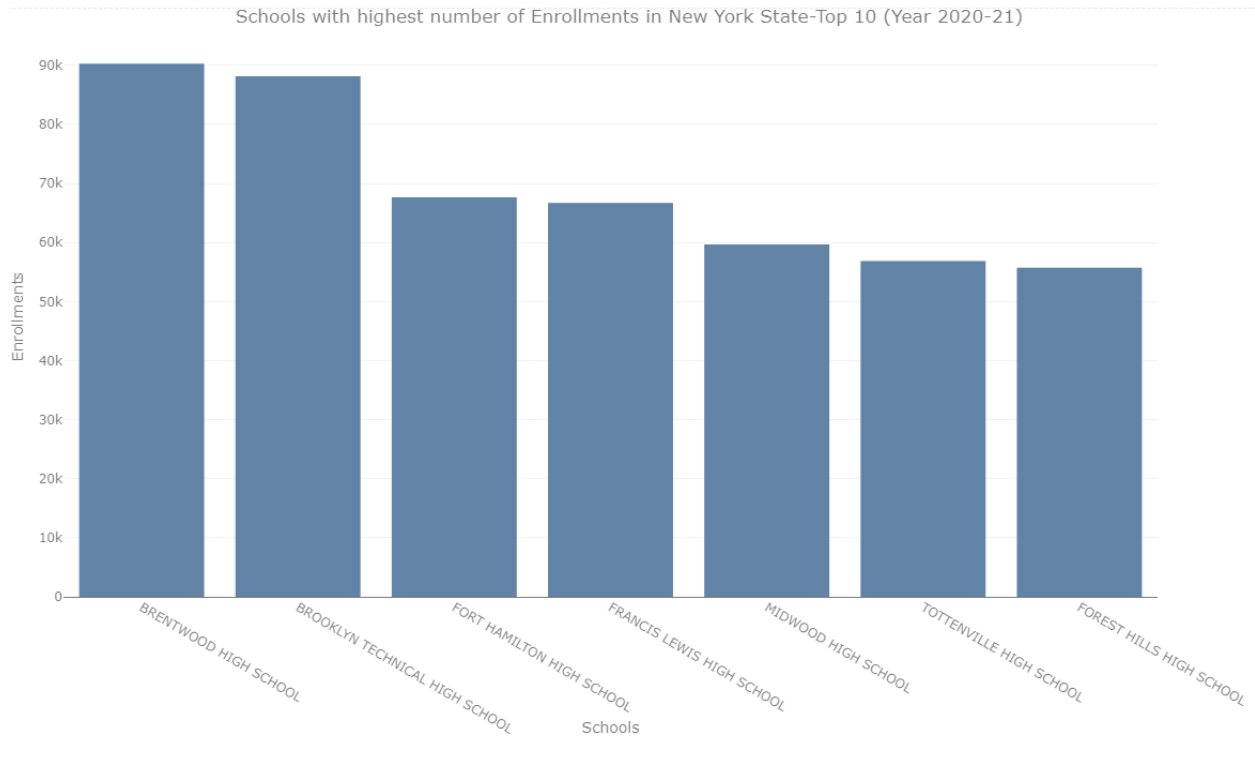


The screenshot shows a data table with two columns: 'county\_name' and 'Total\_Enrollments'. The table is displayed in a web browser window with tabs for 'hACKATHON.Rmd', 'top/\_counties', and 'Hacka'. The table contains the following data:

	county_name	Total_Enrollments
24	KINGS	1277520
52	SUFFOLK	1172160
41	QUEENS	1150260
31	NEW YORK	976220
30	NASSAU	968800
3	BRONX	855120
60	WESTCHESTER	664440

### **School Comparison by highest enrollment**

A deeper analysis to confirm the above is conducted to confirm the above inference; the counties having the highest population are among the counties having the highest enrollment too.

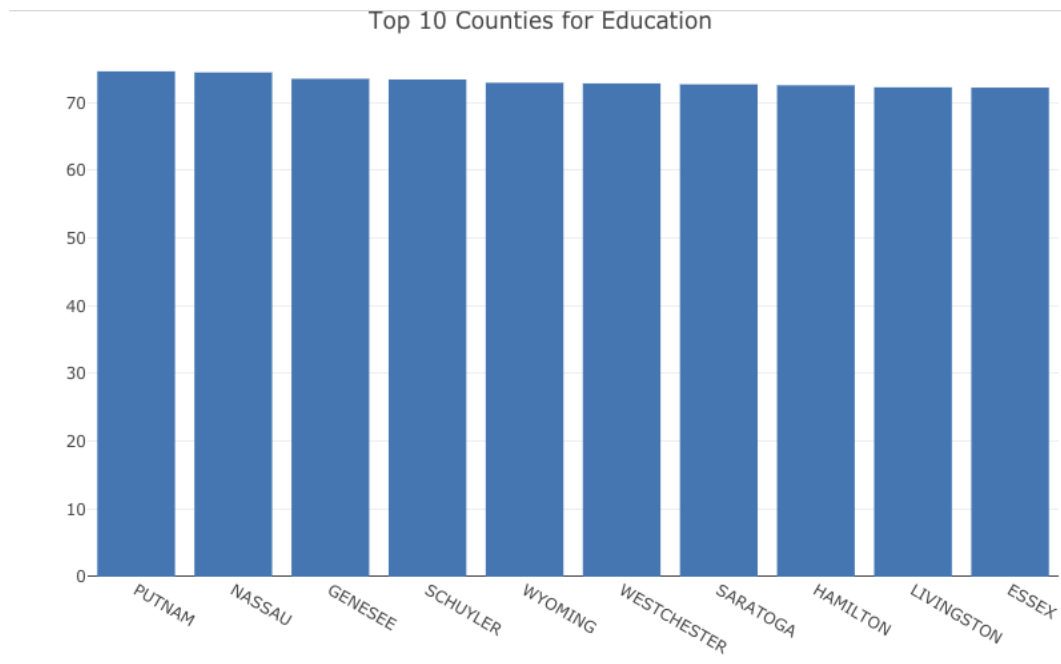


The chart shows Brentwood High School, Suffolk having the highest enrollment in the year 2021 followed by Brooklyn Technical High School, Kings, Fort Hamilton High School, Kings, and Francis Lewis High School, Queens. The counties having the highest population consist of the schools having the highest population hence bolstering the support for the inference.

Filter		
aggregation_name	county_name	Total_Enrollments
1 BRENTWOOD HIGH SCHOOL	SUFFOLK	90300
2 BROOKLYN TECHNICAL HIGH SCHOOL	KINGS	88180
3 FORT HAMILTON HIGH SCHOOL	KINGS	67660
4 FRANCIS LEWIS HIGH SCHOOL	QUEENS	66700
5 MIDWOOD HIGH SCHOOL	KINGS	59680
6 TOTTENVILLE HIGH SCHOOL	RICHMOND	56860
7 FOREST HILLS HIGH SCHOOL	QUEENS	55720

### County Average by Education Matrix

An Education Score is introduced to find the best-performing counties i.e., 80% of the graduation percentage - 20% of the Dropout percentage. The top 10 counties are shown below.



Putnam County comes up with a mean graduation percentage of 94% and a mean dropout percentage of 2.9% leading to an Education Score of 74.62. We can also observe from the above plot that the top 10 counties have varying education scores from 75 to 72 indicating that many counties are performing as good as the top county. The graduation percentage of the top counties varies between 94% to 91% whereas the dropout% varies from 5% to 2% leading to an even performance score.

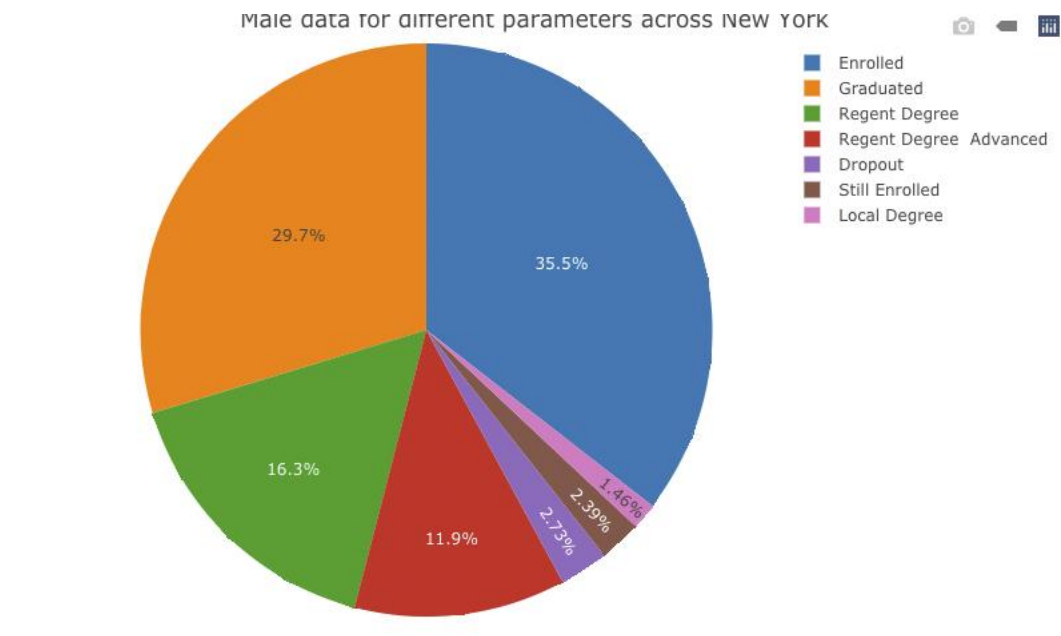
Description: df [10 x 4]

	df_county_mean_grad.county_name <chr>	df_county_mean_grad.gradpct <dbl>	df_county_mean_dropout.dropoutpct <dbl>	EducationScore <dbl>
40	PUTNAM	94.0	2.9	74.62
30	NASSAU	93.7	2.5	74.46
19	GENESEE	92.7	3.2	73.52
49	SCHUYLER	92.7	3.7	73.42
61	WYOMING	92.3	4.5	72.94
46	SARATOGA	92.0	4.5	72.70
60	WESTCHESTER	91.8	3.0	72.84
26	LIVINGSTON	91.6	5.1	72.26
16	ESSEX	91.5	4.9	72.22
21	HAMILTON	91.5	3.2	72.56

1-10 of 10 rows

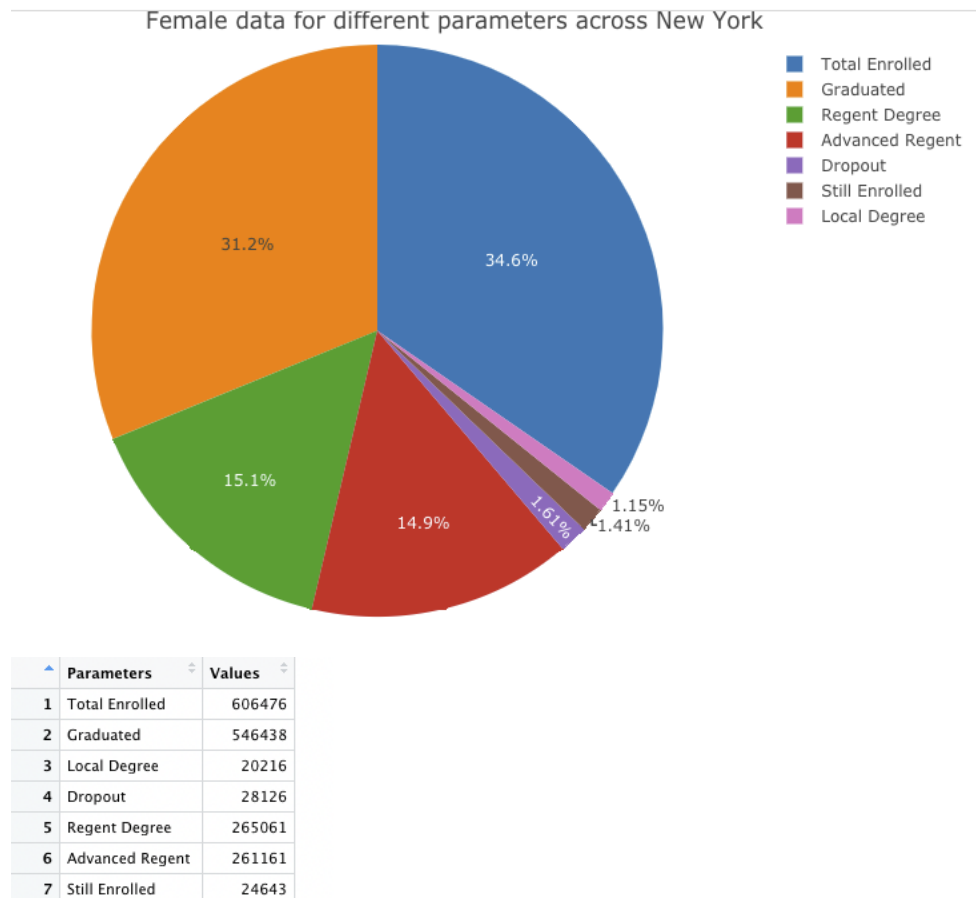
## Male v Female, statewide basis

The educational analysis also arises the question of gender disparity within educational institutions. A quick look into the charts gives us a good overview of the recent percentage of male and the female populous in terms of enrolled, graduated, recent degree, recent advanced degree, dropout, still enrolled and local degree students in the state of New York.



Looking at the male population 35.5% are currently enrolled students, 29.7% are graduated students, 16.3% are recent degree holders and 11.9% are recently advanced degree holders. Also, a low number is seen in terms of the dropout rate i.e. 1.4%.

	Parameters	Enroll_cnt
1	Enrolled	640452
2	Graduated	535447
3	Local Degree	26348
4	Dropout	49322
5	Regent Degree	293601
6	Regent Degree Advanced	215498
7	Still Enrolled	43072



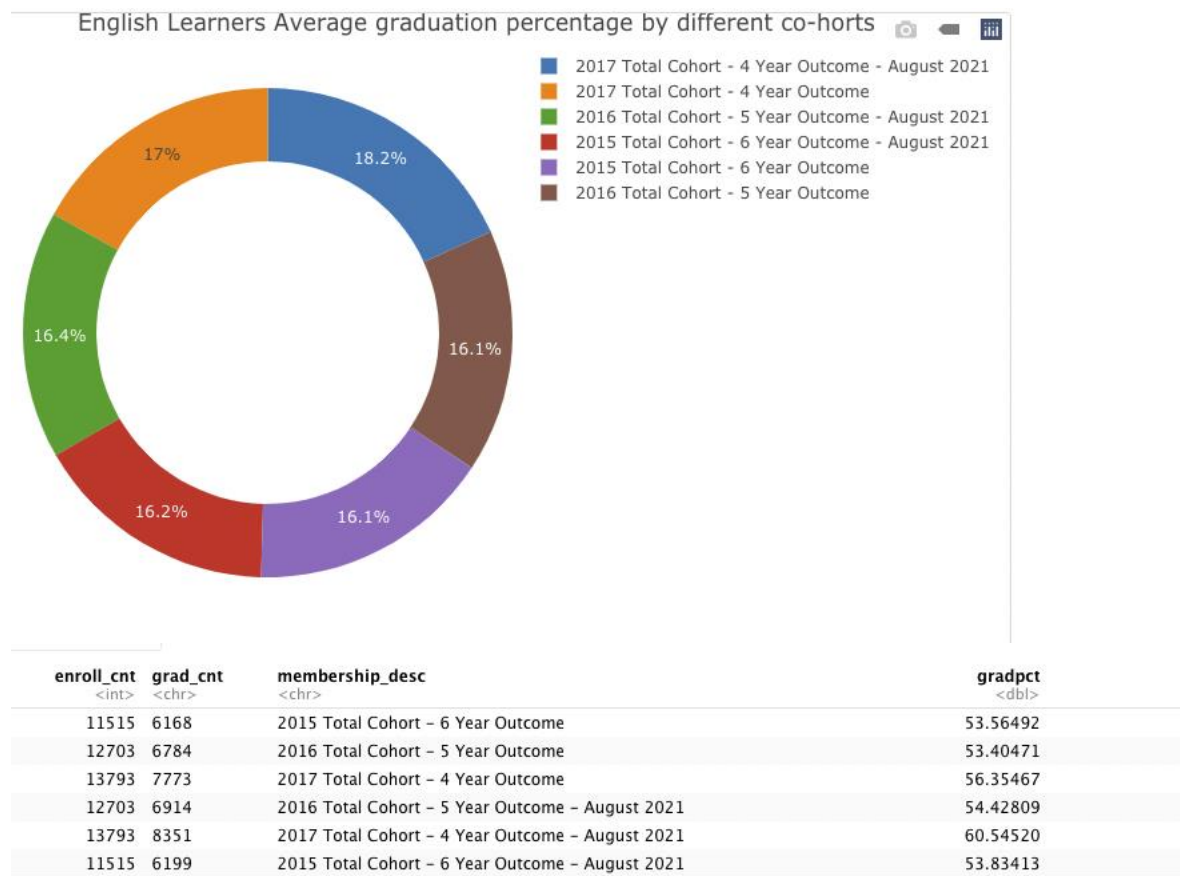
Similarly with the female populous the number of graduated females is 31.2%, 15.1% are recent degree holders, 14.9% are advanced degree holders and only 1.1% are in the dropout count.

The above observations tells us that there is a higher percentage of female graduates and female graduate holding advanced degrees and also have a lower dropout count.

## 3.2 Comparative Analysis: Language, Disability, Race, Migrant, eco

### English vs Non-English Speakers, Statewide

Studies across different cohorts are available giving us an opportunity to look into the participation across the English-speaking population and the non- English speaking population in the field of education according to the graduation percentage.

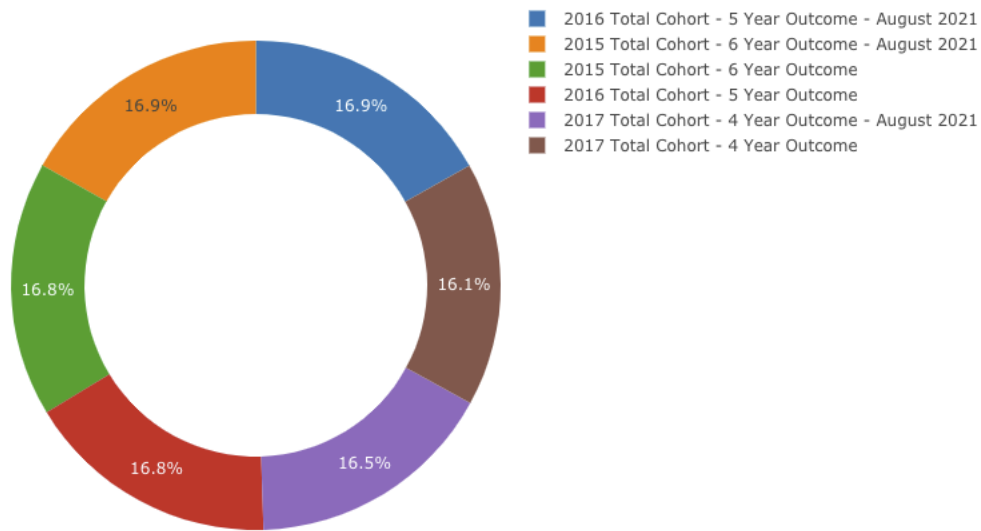


rows

The wheel shows the percentage count of the English-speaking population across different studies conducted over various years covering a timeline of 2015 to 2021. The English-speaking population appears to be high with leading 18.2% in the cohort indicated by the color 'blue' and having a variation across other cohorts from 16% to 18%.



Non-English Learners Average graduation percentage by different co-horts



enroll_cnt <int>	grad_cnt <chr>	membership_desc <chr>	gradpct <dbl>
195881	175682	2015 Total Cohort - 6 Year Outcome	89.68813
195148	174882	2016 Total Cohort - 5 Year Outcome	89.61506
194424	167053	2017 Total Cohort - 4 Year Outcome	85.92201
195148	175373	2016 Total Cohort - 5 Year Outcome - August 2021	89.86667
194424	170844	2017 Total Cohort - 4 Year Outcome - August 2021	87.87187
195881	175862	2015 Total Cohort - 6 Year Outcome - August 2021	89.78002

rows

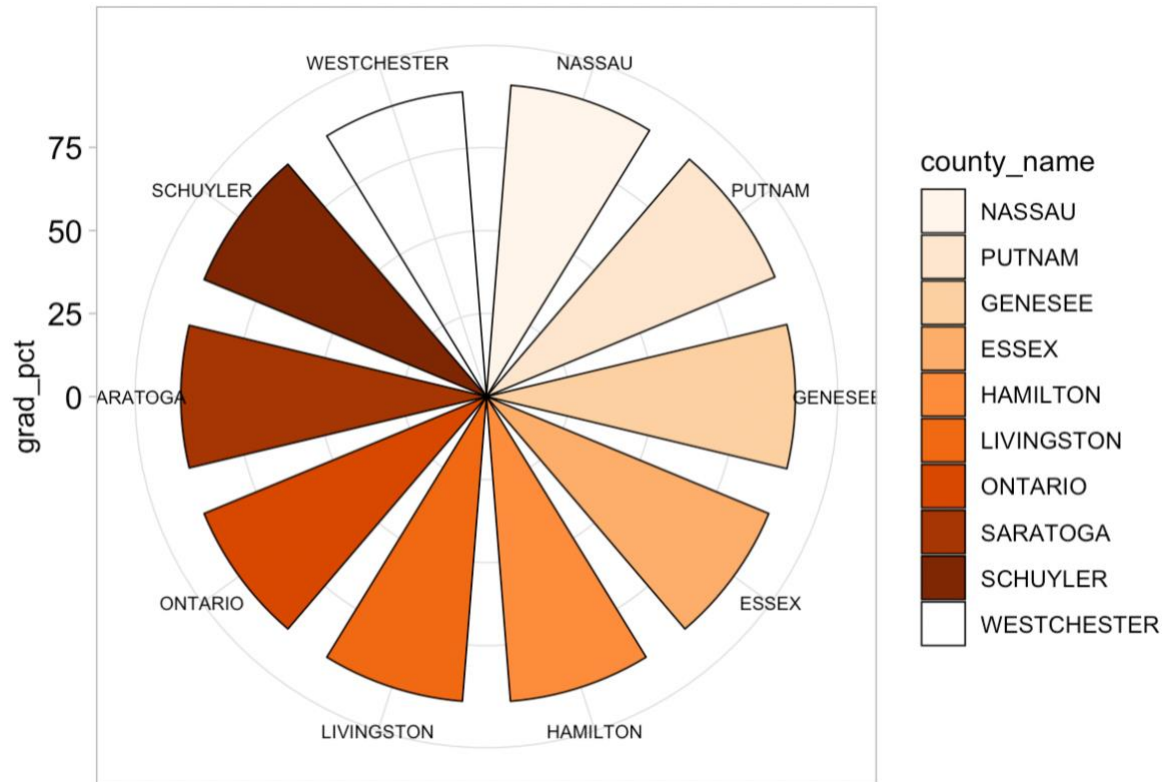
The wheel shows the percentage count of the non-English-speaking population across different studies conducted over various years covering a timeline of 2015 to 2021.

The chart shows the highest performance in the year of 2016 to 2021 cohort indicated by blue and a variation between 16% to 17% across others.

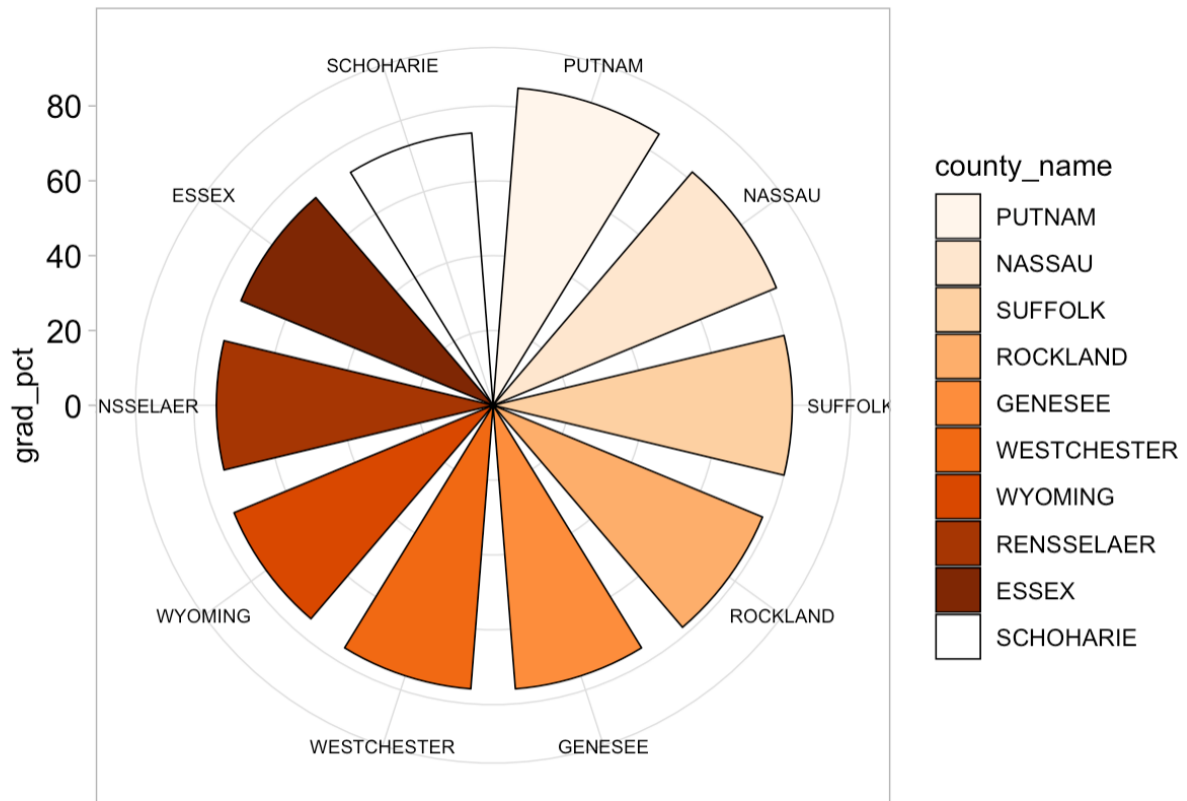
From the above, we can conclude that the overall participation among English and non-English speakers in the field of education is almost similar having a close number of ~17 in the timeline 2016-2021.

## Disability v All

The education system has been supportive of the disabled community helping them by providing the necessary arrangements in times of need. This assumption is put to test via the analysis conducted.



The above radial chart shows the graduation percentage across various counties of all students in the state of New York. The counties of Nassau County leads with a graduation percentage of 94% and is followed by Putnam County(94%), Genesee County(93%) among others as shown above having a varying graduation rate of 94% to 92%



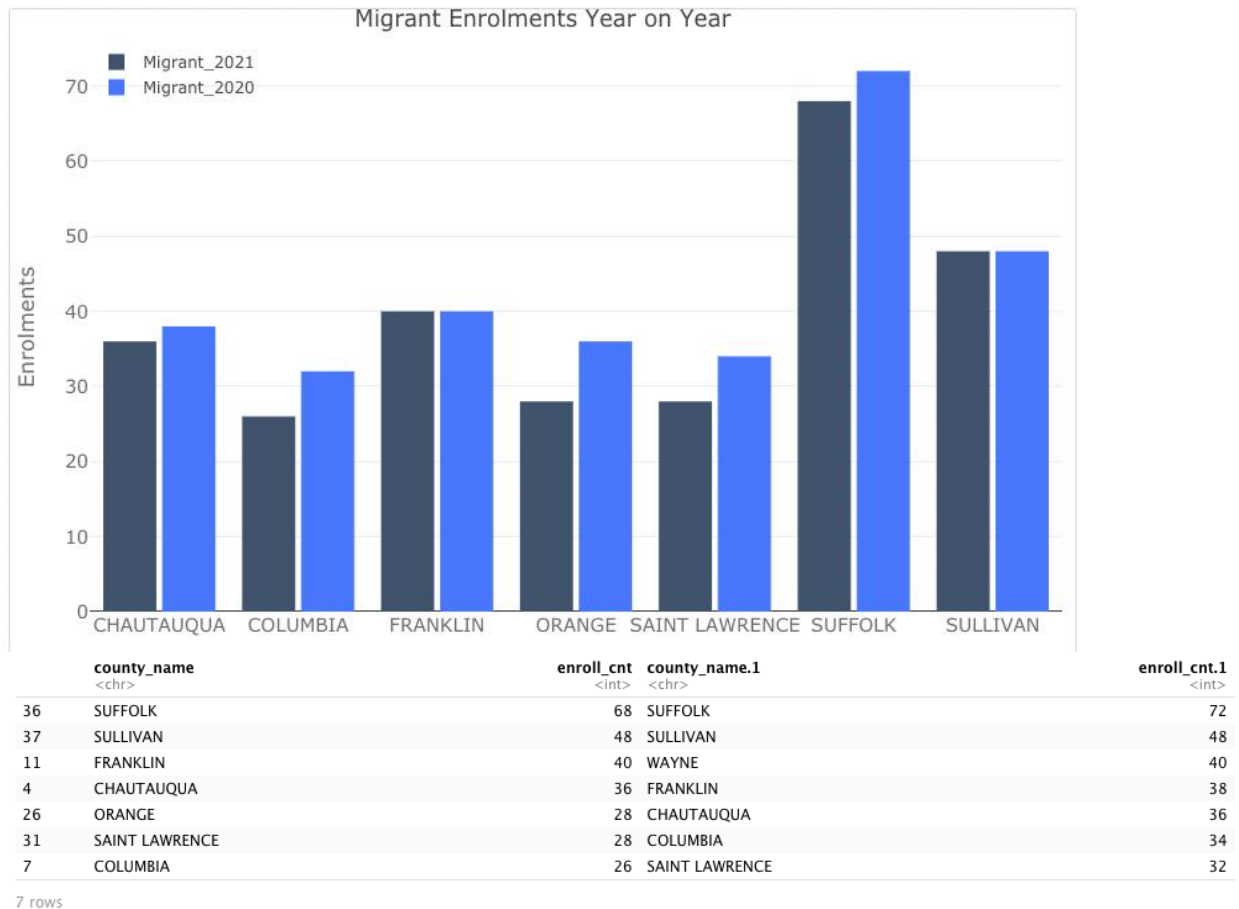
county\_name

Whereas it can be seen the that assumption might not be true. Although Putnam county comes in lead with the previous observation having the graduation percentage of 85% but falls overall with a low in Schoharie county the graduation percentage of 73% and an overall variation of 85% to 73%.

Although the system seems supportive of providing equal opportunities in the field of education further actions should be taken to improve the conditions in counties having low graduation percentage.

#### Migrant2020 vs Migrant2021 by County

A study across the migrated Populus in the year 2020 vs the migrated Populus in the year 2021 is conducted to find and compare the participation level of both communities.

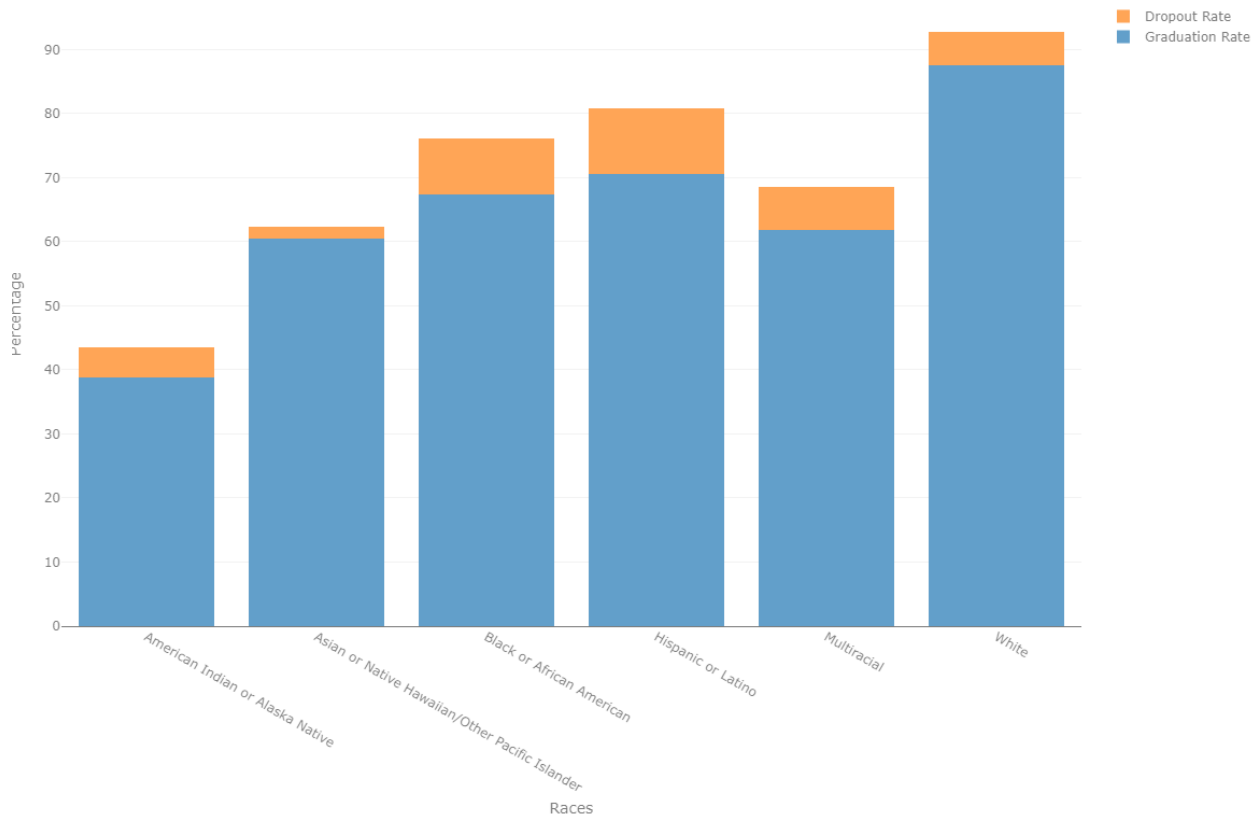


The above plot showcases the difference in enrollment numbers in Chautauqua County, Columbia County, Franklin County, Orange County, Saint Lawrence County, Suffolk County, and Sullivan County, in terms of enrollment count.

It can be observed that the education system is doing almost similar in many counties over the time period of 2020 to 2021 with a slight rise in numbers in Chautauqua County and Suffolk County.

## Race Wise – Dropout Rate v Graduation Rate

To get an overview of the education parameter of different racial population.



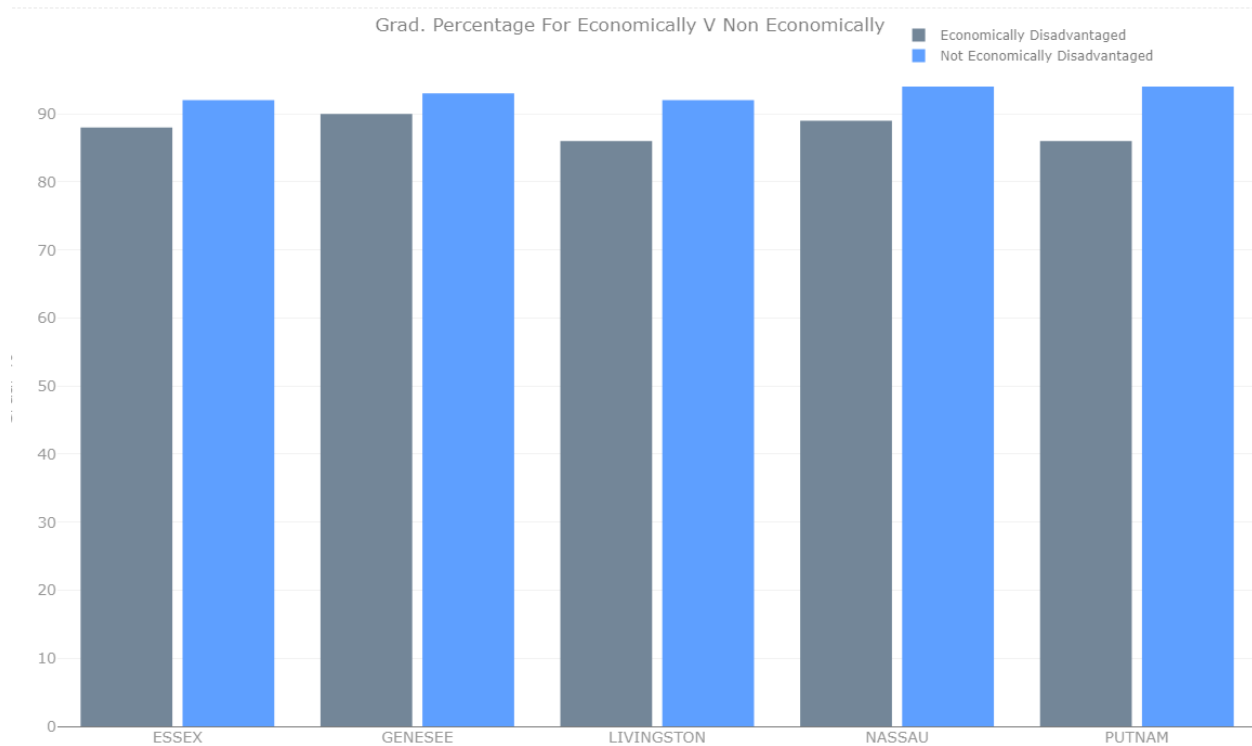
Races			
Filter			
	subgroup_name	grad_pct	dropout_pct
1	American Indian or Alaska Native	38.75000	4.793919
2	Asian or Native Hawaiian/Other Pacific Islander	60.49448	1.784530
3	Black or African American	67.44262	8.688525
4	Hispanic or Latino	70.52174	10.358696
5	Multiracial	61.78142	6.786885
6	White	87.47581	5.263441

The analysis shows how the graduation percentage and dropout percentage vary across the State of New York with the Caucasian population having the highest graduation percentage of 87.47% followed by the Hispanic Populus(70.5%) and the African American Populus(67.4%) .

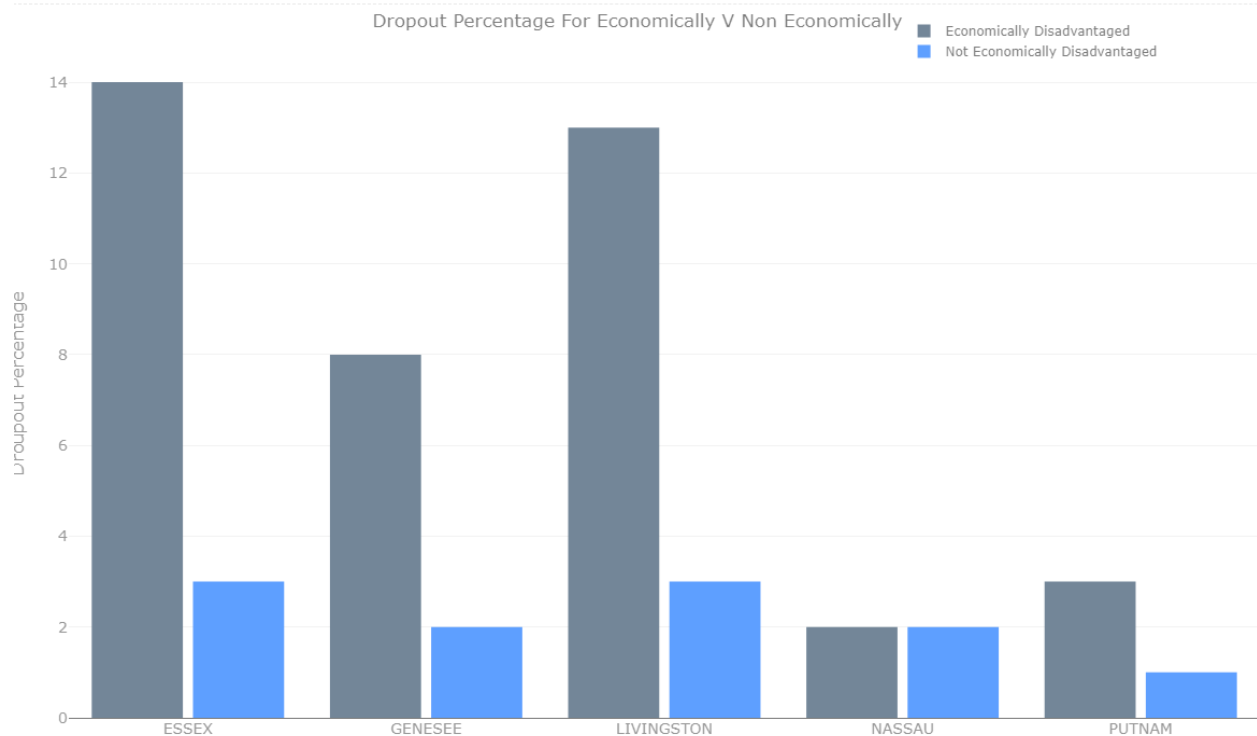
It is also observed that the dropout percentage is led by the Hispanic Population with a dropout percentage of 10.3% followed by the African American Populus(8.6%), and multiracial Populus(6.7%) among others.

## Economically v Not-Economically Challenged

Economic Analysis is necessary for the revision of budget allocation among different counties, a comparative analysis is conducted taking into account the graduation percentage and dropout percentage between economically and non-Economically Challenged groups.



An even graduation percentage is seen for both the groups with the highest graduation rate in Genesee County for the economically challenged community(90%) and a variation from 90% to 86%; and Nassau and Putnam having similar high graduation rates for the non-economically challenged community(90%).



A wide disparity is seen in the dropout rate between the two communities with the economically challenged community having a variation of 14% to 2%, Essex County having the highest dropout percentage and the non-economically challenged community having a variation of 3% to 1%.

We can conclude that a revised budget for the affected counties can be helpful in providing support in terms of education in affected areas.

	county_name	grad_pct.x	dropout_pct.x	grad_pct.y	dropout_pct.y
1	ESSEX	88	14	92	3
2	GENESEE	90	8	93	2
3	LIVINGSTON	86	13	92	3
4	NASSAU	89	2	94	2
5	PUTNAM	86	3	94	1

## 4 Conclusion

The above analysis helps us observe the condition across various territories included through which we reach the conclusions as follows,

The counties having the highest population are among the counties also having the highest enrollment rate as assumed and bolstered by the Enrollment Comparison by County analysis and School Comparison by highest enrollment analysis respectively.

Good standardization is observed within the system as the counties show a close number in terms of education scores.

The female Populus has higher percentage numbers in graduates and graduates holding advanced degrees with low dropout rates whereas the male populous is also doing well in terms of graduation and dropout percentage.

The overall participation among English and non-English speakers in the field of education is almost similar supporting the effectiveness of the system for people of different languages.

The system seems supportive of providing equal opportunities in the field of education, but further actions should be taken to support the diverse population while considering the African American and Hispanic populous.

The education system is also doing almost similar in many counties over the time of 2020 to 2021 with a slight rise in numbers in Chautauqua County and Suffolk County for the migrants supporting the effective systems in those areas.

Further analysis should be done to find the cause of the high dropout rate among multiracial communities while, proper funds allocation to ensure equal opportunities despite the economic gap.

## 5 References

[https://www.newyork-demographics.com/counties by population](https://www.newyork-demographics.com/counties_by_population)  
<https://plotly.com/>