Early Warning Indicators
Using Data to Identify Students At Risk of Dropping Out

September 18, 2017
WHO WE ARE

- 6 Charter Partners
- 80 Schools
- 40,000 Students
- 13 Special Facilities
- 7,000 Employees
- 3,000 Teachers
- 1 Bold Journey
ABOUT TULSA PUBLIC SCHOOLS

MISSION AND VISION

Tulsa Public Schools is the destination for extraordinary educators who work with our community and families to ignite the joy of learning and prepare every student for the greatest success in college, careers and life.

Our mission is to inspire and prepare every student to love learning, achieve ambitious goals and make positive contributions to our world.

LEARNER
We will learn, apply, reflect, adjust and persist together

CONTRIBUTOR
We will contribute to the well-being and success of our students and schools

DESIGNER
We will improve learning, solve problems and bring ideas to life through innovative and intentional design
Drop-out rates vs. graduation rates
Graduation rates are improving

<table>
<thead>
<tr>
<th>Year</th>
<th>Graduation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>69.37%</td>
</tr>
<tr>
<td>2013</td>
<td>64.45%</td>
</tr>
<tr>
<td>2014</td>
<td>62.80%</td>
</tr>
<tr>
<td>2015</td>
<td>67.49%</td>
</tr>
<tr>
<td>2016</td>
<td>72.50%</td>
</tr>
<tr>
<td>2017</td>
<td>(increasing)</td>
</tr>
</tbody>
</table>
What will it take to continue seeing improved graduation rates?
What is the difference between graduation rates and dropout rates?

<table>
<thead>
<tr>
<th>Graduation rates</th>
<th>Drop-out rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Percent of students completing all credit requirements within four years of starting high school</td>
<td>• Percent of students who leave Tulsa Public Schools before graduating and do not enroll in another degree issuing institution</td>
</tr>
<tr>
<td>• Many students who finish their fourth year without enough credits continue on to earn their diploma but they are currently not included in the cohort graduation rate</td>
<td>• Students can be a drop-out at one point but still graduate on time</td>
</tr>
<tr>
<td></td>
<td>• Adds up over the course of years</td>
</tr>
</tbody>
</table>
What risk factors are most related to dropping out?
What factors are we able to explore?

- Student Conduct
- Demographics
- Teacher Characteristics
- Student Assessment
- School Characteristics
What factors did we use?

<table>
<thead>
<tr>
<th>Student Conduct</th>
<th>Student Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count of referrals</td>
<td>Change in state math scores</td>
</tr>
<tr>
<td>Count of suspensions</td>
<td>Average state math scores</td>
</tr>
<tr>
<td>Frequency of referrals and suspensions</td>
<td>Change in state reading scores</td>
</tr>
<tr>
<td>Severity of infraction</td>
<td>Average state reading scores</td>
</tr>
<tr>
<td>Total amount of referrals and suspensions</td>
<td>Average of all state test scores</td>
</tr>
<tr>
<td>Change in attendance</td>
<td>SAT scores</td>
</tr>
<tr>
<td>Average student attendance</td>
<td>Average of course grades</td>
</tr>
<tr>
<td>Change in student absences</td>
<td>Change in course grades</td>
</tr>
<tr>
<td>Average student absences</td>
<td></td>
</tr>
</tbody>
</table>
What factors did we use?

**Demographics**
- Lunch status
- Student grade level
- Ethnicity
- English language learner
- Special education

**Teacher Characteristics**
- Change in comprehensive score for all of the student’s teachers evaluations
- Average comprehensive score for all of the student’s teachers
- Average Tripod score for all of the student’s teachers
- Average Tulsa model score for all of the student’s teachers
- Average value added score for all of the student’s teachers.
What factors did we use?

All assessment scores

- Change in all scores for all schools attended by the student
- Average of all scores for all schools the student attended
- Average Tripod score for all schools the student attended
- Average Tulsa model scores for all schools attended by the student
- Average value added scores for all schools attended by the student
What did we find?
Top five factors

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factor</th>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Average class attendance</td>
<td>Student Conduct</td>
</tr>
<tr>
<td>2</td>
<td>Change in class attendance</td>
<td>Student Conduct</td>
</tr>
<tr>
<td>3</td>
<td>Student grade level</td>
<td>Demographic</td>
</tr>
<tr>
<td>4</td>
<td>Average student course grade</td>
<td>Student Assessment</td>
</tr>
<tr>
<td>5</td>
<td>Severity of conduct infraction</td>
<td>Student Conduct</td>
</tr>
</tbody>
</table>
Average attendance
Change in attendance

- Change in Attendance
  - Percent Dropped
    - Decreases Over Time
    - Increases Over Time

- Drop Out Probability
  - Change in Attendance
  - Probability Range: 0% to 100%
Grade level
Average course grade

- **F**: 12% dropped
- **D**: 24% dropped
- **C**: 12% dropped
- **B**: 6% dropped
- **A**: 0% dropped

Average Course Grade
• Attendance is the most important factor when trying to predict the likelihood of a student dropping out.
• The analysis will help to inform what programs/interventions the district should put in place to continue our upward trend in improving graduation rates.
How can this information help schools?
How can a statistical model help?

- Beyond just identifying the most impactful factors, we wanted to develop a model that could be used to identify students at risk of dropping out.

- We aim to use our findings to inform the development of an early warning indicator system to be included in the data dashboards.
What makes an early warning system valuable?

- Ability to intervene before it is too late
- Deploy limited resources in a strategic and targeted way
- Helps lead us to our goal of graduating all students college and career ready.
Summary of early warning indicators

- **High Risk for Dropping Out:** Absences, Ave. Class Grade, Grade Level
  - **Reason for Dropping Out:** Absences
  - **Suggested Interventions:** Counselling on Absences, Fill out Academic Improvement Plan

- **Moderate Risk for Dropping Out:** Absences
  - **Reason for Dropping Out:** Absences
  - **Suggested Interventions:** Counselling on Absences

- **Low Risk for Dropping Out:** Absences
  - **Reason for Dropping Out:** Absences
  - **Suggested Interventions:**
Actions moving forward

• These findings will be shared with school leaders and counselors in the coming week(s) to help inform their practice

• The data team will leverage this information in the development of new tools and resources for school leaders and teachers

• Additional white papers exploring critical data points will be developed
Questions