Abstract:

Using data from the District Information System for Education we have developed a plan that will improve the Indian education system and reduce the national dropout rate.

We found that amenities that most likely correlate with school performance include:

1. Schools with Head Master Room
2. Schools with Computer & Internet
3. Schools with Electricity

Using a trained numerical regression machine learning model, new dropout rates were predicted for each state as each of the above amenities were increased so that they were standard features of every school. The new predicted rate for each state was lower in all but 4 of the states. The national average decreased by 13.67 percent

Hypothesis:

When teachers collaborate, students academically improve. All three of the above amenities can be used by teachers to collaborate. Electricity powers one of the best resources to collaborate, the internet. Head masters help teachers cooperate by setting academic goals and policies for the intuition. This plan attempts to maximize the tools for collaboration and predict its effect on students.

Method:

National Dropout rate average:

17.05 %

States with the highest dropout rates:

State	Dropout rate (2015 Year)
Odisha	29.56 %
Tripura	28.42 %
Assam	27.06 %
Karnataka	26.18 %
Bihar	25.90 %

Factors found to correlate most with Dropout rate:

Attribute	Correlation	Attribute	Correlation
State	76.35 %	Schools Having SMDC	4.09 %
Schools with Head Master Room	25.40 %	Student-Classroom Ratio	3.95 %
Schools with Computer & Internet	24.49 %	Schools with Ramp if Needed	2.19 %
Schools with Electricity	23.76 %	Schools with Playground Facility	2.18 %
Schools with Lab. Assistant	22.22 %	Schools with Hostel for Girls	1.71 %
Schools with Sch. Bld. Committee	19.94 %	Female Teachers	1.40 %
Schools Conducted Med. Check-up	19.62 %	Schools with Toilet for CWSN	0.99 %
Schools with Full Time Librarian	16.90 %	Girls Enrolment	0.84 %
Schools with Girls Toilet	13.94 %	Schools with Building	0.50 %
Schools with Boys Toilet	12.39 %	Schools with Hostel for Boys	0.36 %
Schools with ICT Laboratory	10.93 %	Pupil-Teacher Ratio	0 %
Schools with Drinking Water	7.57 %	Schools Exclusively for CWSN	0 %
Schools Having PTA	7.08 %	Schools with Boundary wall	0 %
Schools with Library	6.60 %	Single-Teacher Schools	0 %
Schools Established Since 2006	4.25 %	Single-Classroom Schools	0 %

Suggested improvements to facilities:

1. Increase the number of Head master's room and head masters to 100 %
2. Increase schools the number of schools with electricity access to 100%
3. Increase schools the number of schools with Computers and Internet access to 100 %

Results:

Using our trained model, the following predicted dropout rates were received

National Dropout rate average:

14.72 %

Percent change of National Dropout rate average:

-13.67 %

New expected dropout rates from the states with the highest current dropout rate:

State	Predicted Dropout rate	Percent change from 2015
Odisha	23.16 %	-21.65 %
Tripura	21.78 %	-23.36 %
Assam	18.58 %	-31.34 %
Karnataka	22.24 %	-15.05 %
Bihar	17.57 %	-32.16 %

Conclusion:

From the results it appears increasing tools for teacher collaboration improves school completion rate. These results seem to be in line with a study out of the University of Michigan that found, "teacher collaboration is associated with increased levels of student achievement" (Goddard 891).

Complete Data set:

State	2015 Dropout rate	Predicted Dropout rate	Percent change
National Average	17.05 %	14.72 %	-13.67 %
Andhra Pradesh	15.71 %	14.62 %	-6.94 %
Arunachal Pradesh	17.11 %	14.64 %	-14.44 %
Assam	27.06 %	18.58 %	-31.34 %
Bihar	25.90 %	17.57 %	-32.16 %
Chhattisgarh	21.26 %	16.74 %	-21.26 %
Delhi	11.81 %	6.01 %	-49.11 %
Goa	11.15 %	10.80 %	-3.14 %
Gujarat	24.92 %	17.81 %	-28.53 %
Haryana	15.89 %	11.29 %	-28.95 %
Himachal Pradesh	6.07 %	13.14 %	116.47 %
Jammu & Kashmir	17.28 %	13.01 %	-24.71
Jharkhand	24.00 %	18.91 %	-17.04
Karnataka	26.18 %	22.24 %	-15.05 %
Kerala	12.32 %	9.75 %	-20.86
Madhya Pradesh	24.77 %	20.24 %	-18.29
Maharashtra	12.87 %	11.77 %	-8.55 %
Manipur	14.38 %	19.62 %	36.44 %
Meghalaya	20.52 %	13.52 %	-34.11
Mizoram	21.88 %	20.15 %	-7.90
Nagaland	18.23 %	14.77 %	-18.98 %
Odisha	29.56 %	23.16 %	-21.65 %
Punjab	8.86 %	10.84 %	22.35 %
Rajasthan	13.48 %	12.96 %	-3.86 %
Sikkim	15.89 %	13.30 %	-16.30 %
Tamil Nadu	8.10 %	5.21 %	-35.68 %
Tripura	28.42 %	21.78 %	-23.36 %
Uttar Pradesh	10.22 %	7.23 %	-29.26 %
Uttarakhand	10.40 %	13.23 %	27.21 %
West Bengal	17.80 %	14.50 %	-18.54 %

References:

Goddard, Yvonne L., Roger D. Goddard, and Megan Tschannen-Moran. "A theoretical and empirical investigation of teacher collaboration for school improvement and student achievement in public elementary schools." Teachers college record 109.4 (2007): 877-896.