ENHANCE EDUCATION ACHIEVEMENT
TO ENHANCE TRUST

Using data science & innovation to built
a sustainable tertiary education model

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FROM DEFORM

Deform intended to provide potential symptoms of potential lack of integrity as well as a value-based model. In the end, how to disseminate those adequately?

- ✓ A professional, lifelong learning certificate
- ✗ Not targeted at academia
- ✓ An open source tool (freely available using EPALE)
- ✗ Not an "insider" job but trying to go virale

TO PRORES

The question of the lack of trust in : science?scientists?academia?
Trust in the ones providing the knowledge…

- ✓ Not a question of lack of trust in science (70/30 rate for 50 years)
- ✗ A question of answering the questions asked…
- ✓ Not a question of topic, A Question of making matches : challenges are the same, whatever the field?
- ✗ More than delivering knowledge…

FROM SYPTOMS TO SOLUTIONS

RATIONAL

Gross enrollment ratio in tertiary education
Total enrollment in tertiary education, regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving.

North America
Europe & Central Asia
Latin America & Caribbean
East Asia & Pacific
Middle East & North Africa
South Asia
Sub-Saharan Africa

Source: World Bank
OurWorldInData.org/tertiary-education/ • CC BY-SA
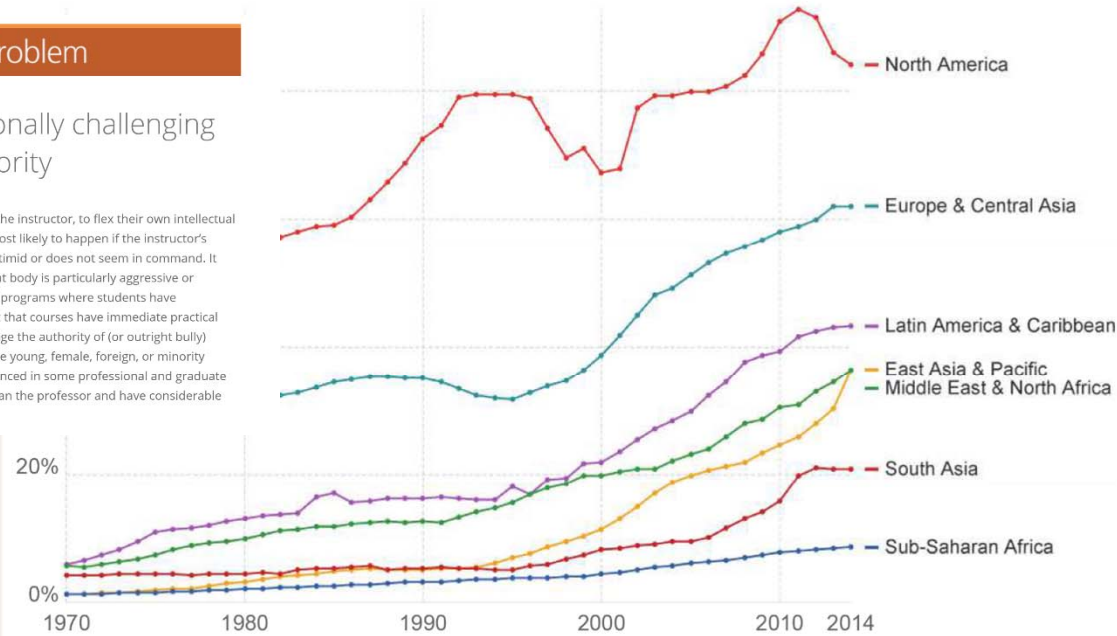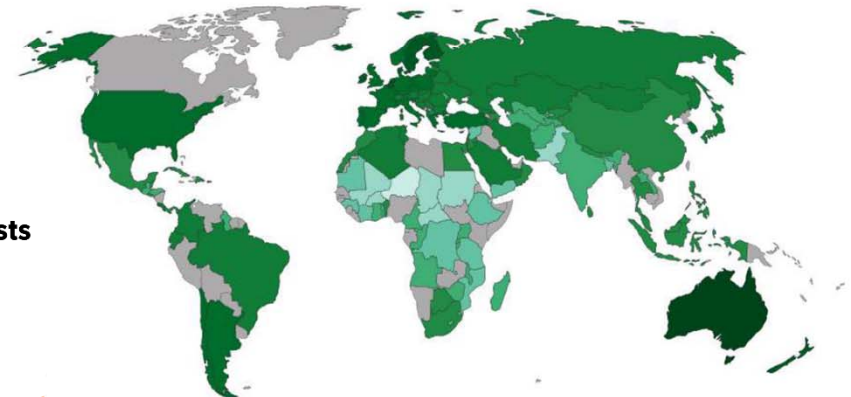
Dropout and Completion in Higher Education in Europe
Main Report

Solve a Teaching Problem

Students are intentionally challenging the instructor's authority

In some instances, students act rudely to test the instructor, to flex their own intellectual muscle, or to show off to classmates. This is most likely to happen if the instructor's authority is in question, for example, if s/he is timid or does not seem in command. It may also happen in contexts where the student body is particularly aggressive or demanding, for example in some professional programs where students have considerable work-world experience and insist that courses have immediate practical utility. Some students may also seek to challenge the authority of (or outright bully) particular categories of instructors, for example young, female, foreign, or minority faculty. This problem can be especially pronounced in some professional and graduate programs where the students may be older than the professor and have considerable experience and expertise themselves.

1 High level of enrollment – low level of achievement
  - A question of misguided orientation?
  - A question of unsuitability for employment?
  - A question of Trust? confidence in the institution to lead everyone towards the goal they have set for themselves: employment? Values?

2 High costs for the Community & for which impact on growth… A10 Indicator
  - a dichotomy of expectations, a misunderstanding of results: appetence/efficiency trade-off.
  - The wrong choice of regressors? => biased questioning
  - Alarming facts : Spendings multiplied by 7 – for a limited impact on growth (spendings 2 time higher than the impact)

Drastically reduce this Non sustainable educative waste

3 Why such a result => the cost of dropouts?
Can education efficiency be enhanced?

School life expectancy, from primary to tertiary education, 2013
The school life expectancy is the number of years a person of school entrance age can expect to spend in the education system. Since school life expectancy is an average based on participation in different levels of education, the average may be pulled down by the number of children who never go to school. Those children who are in school may benefit from many more years of education than the average. The data refers to both sexes.

0 years 2 years 4 years 6 years 8 years 10 years 12 years 14 years 16 years 18 years 20 years 22 years
No data

Source: World Bank
OurWorldInData.org/tertiary-education/ • CC BY-SA

Matthew Lynch, Contributor
Editor of The Edvocate & The Tech Edvocate

High School Dropout Rate: Causes and Costs
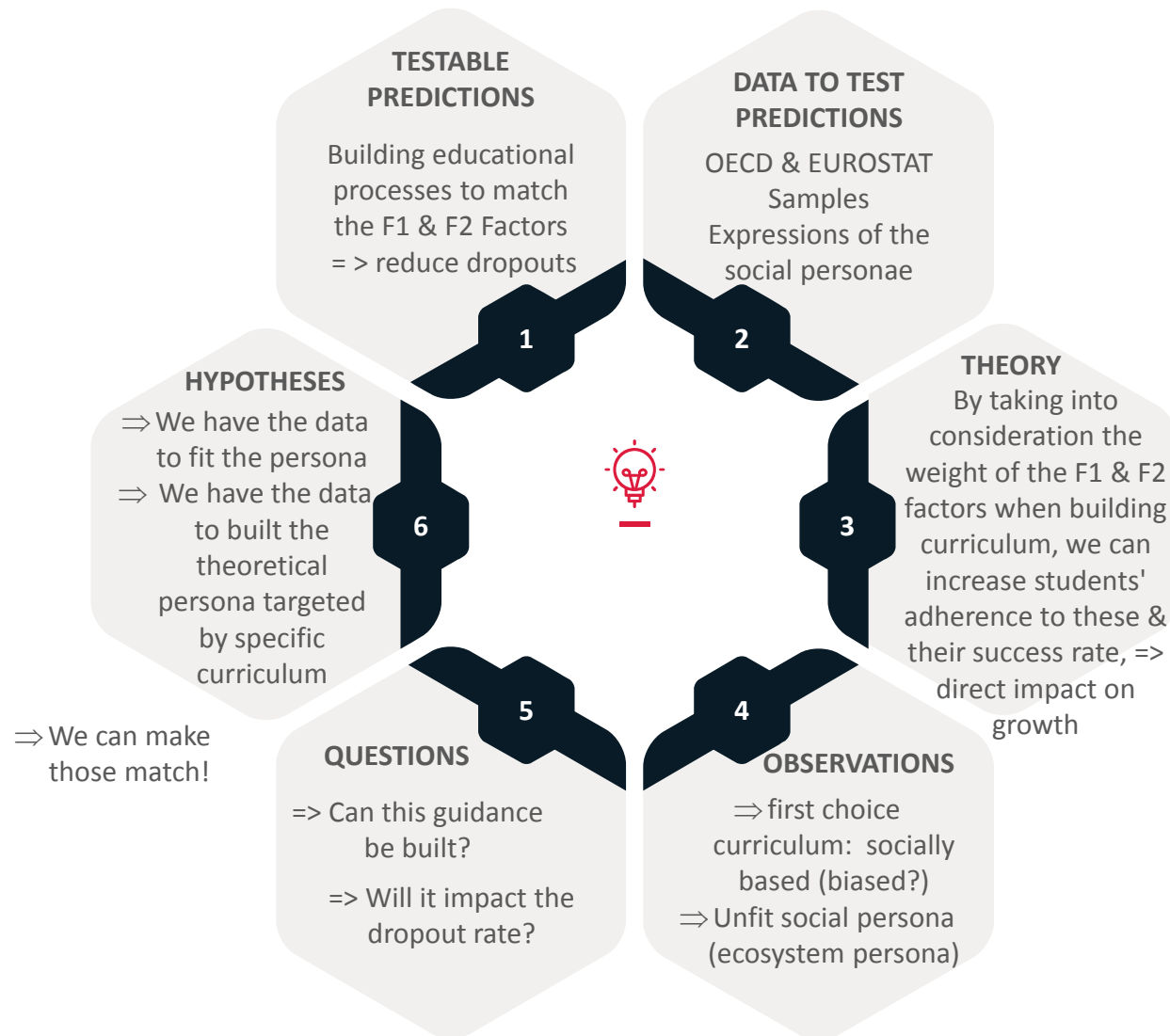05/30/2014 11:16 pm ET | Updated Aug 02, 2014

Last month I dug into the current state of high school dropouts and where American students today stand in historic statistics. In my research, I discovered that while dropout percentages are much lower today than they were a few decades ago, there is still a lot of room for improvement.

Today I want to look at the underlying causes of the dropout mentality and how every student who does not earn a high school diploma hurts society as a whole. My hope is that in discovering shared traits among dropouts, we can achieve higher high school graduation rates as a nation.

HUFFPOST

TRENDING

Sustainability => rational use of ressources including in education

TESTABLE PREDICTIONS

Building educational processes to match the F1 & F2 Factors = > reduce dropouts

DATA TO TEST PREDICTIONS

OECD & EUROSTAT Samples Expressions of the social personae

HYPOTHESES

⇒ We have the data to fit the persona
⇒ We have the data to built the theoretical persona targeted by specific curriculum

⇒ We can make those match!

THEORY

By taking into consideration the weight of the F1 & F2 factors when building curriculum, we can increase students' adherence to these & their success rate, => direct impact on growth

QUESTIONS

=> Can this guidance be built?
=> Will it impact the dropout rate?

OBSERVATIONS

⇒ first choice curriculum: socially based (biased?)
⇒ Unfit social persona (ecosystem persona)

=> Guidance to discover social persona and the training that fill adequately fit this persona

1 **2** **6** **3** **5** **4**

HYPOTHESIS

⇒ Tertiary education is a growth factor, the less the tertiary education a population has, the less its growth is efficient. Direct cause/effect growth & educated workforce availability (OECD) => A10 indicator

⇒ If tertiary education is a growth factor, than dropout rates can be corelated to "losses" in the growth potential, as such the cost is not only what is spend, but also what is lost in growth potential

⇒ Why do students drop-out?
⇒ An indicator that can be cross educational sector?

PROBLEM

High enrollment => high dropout => high costs => high impact
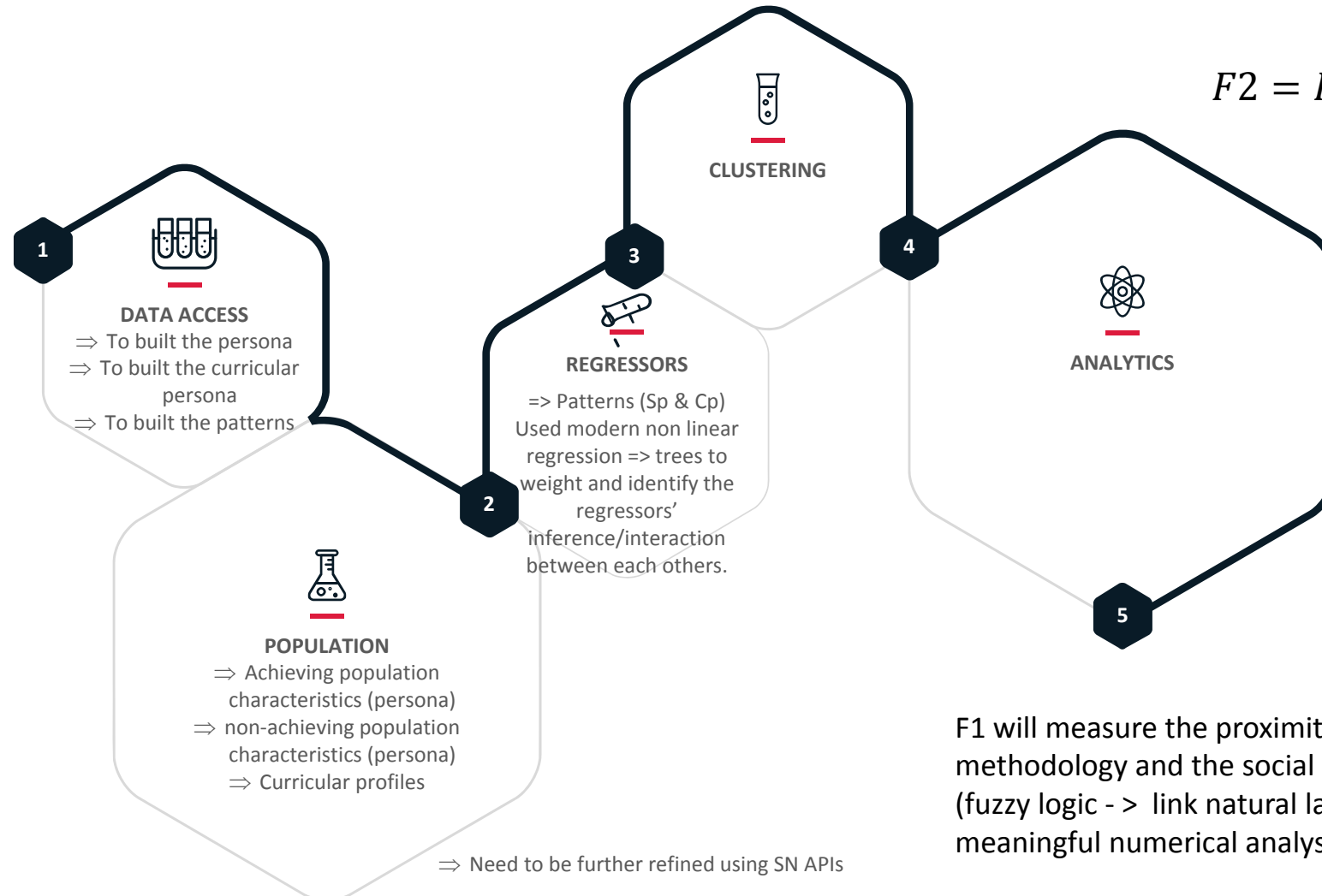What are the needed regressors?

STATEMENT

⇒ Dropout is correlated to two factors each including correlated subfactors:
⇒ **F1 lack of trust in the academic sector to fulfill its task** (pathway to personal equilibrium (social persona) – pleasure – free time – work – personal appreciation - financial comfort (Fulfilling function)
⇒ F2 **lack of adequation of the educational orientation with one's expectations** (difficulties to correct this when one pathway is taken = > problematic of academic fields & silos/specialties (we want to minimize the

PRELIMINARY PROCEDURE

Testing our hypothesis required three phases : (1) collecting and defining the regressors - (2) sampling the (right) population – (3) Testing per -se

$$F2 = P(\sum_{n}^{1} Ps - \sum_{n}^{1} Pc) = 0$$

CLUSTERING

1

DATA ACCESS
⇒ To built the persona
⇒ To built the curricular
persona
⇒ To built the patterns

3

REGRESSORS

=> Patterns (Sp & Cp)
Used modern non linear
regression => trees to
weight and identify the
regressors'
inference/interaction
between each others.

4

ANALYTICS

2

POPULATION
⇒ Achieving population
characteristics (persona)
⇒ non-achieving population
characteristics (persona)
⇒ Curricular profiles

5

F1 will measure the proximity of the academic
methodology and the social persona => trust equation
(fuzzy logic - > link natural language expressions with a
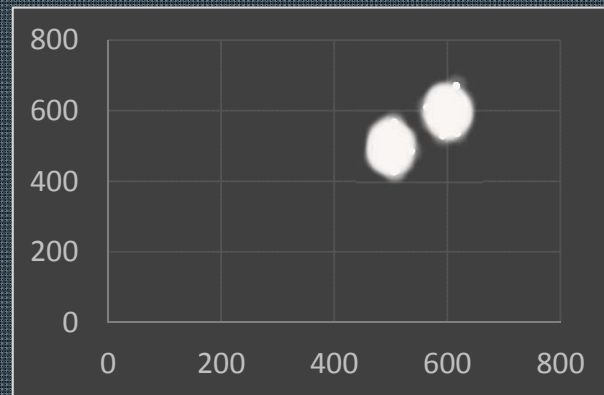meaningful numerical analysis)

⇒ Need to be further refined using SN APIs

RESEARCH RESULTS
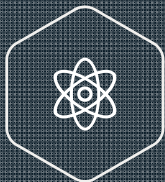
Achieving population
=> Match between the social persona & curricular persona
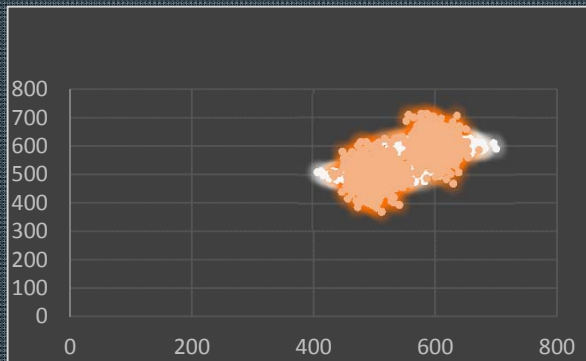
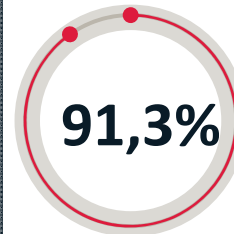**Non- achieving population**
=> mismatch!

14,2%
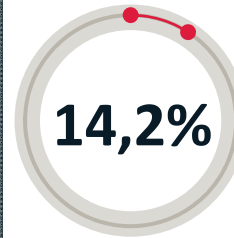
Match level in non-achieving population (at a given time)

Low level of match between the curriculum and social persona

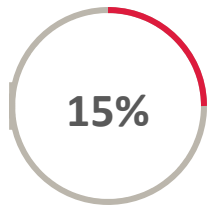**QUESTION**

When does the mismatch occur?

91,3%

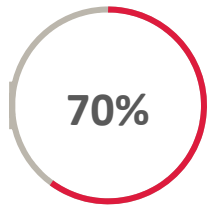**Match level in achieving population (at a given time)**

What are
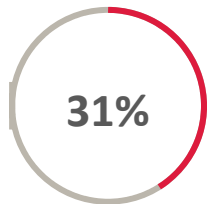
The mismatch factors (Patterns)

MISMATCH
ANALYSIS

15%

💡 **SELDOM CORRECTED**
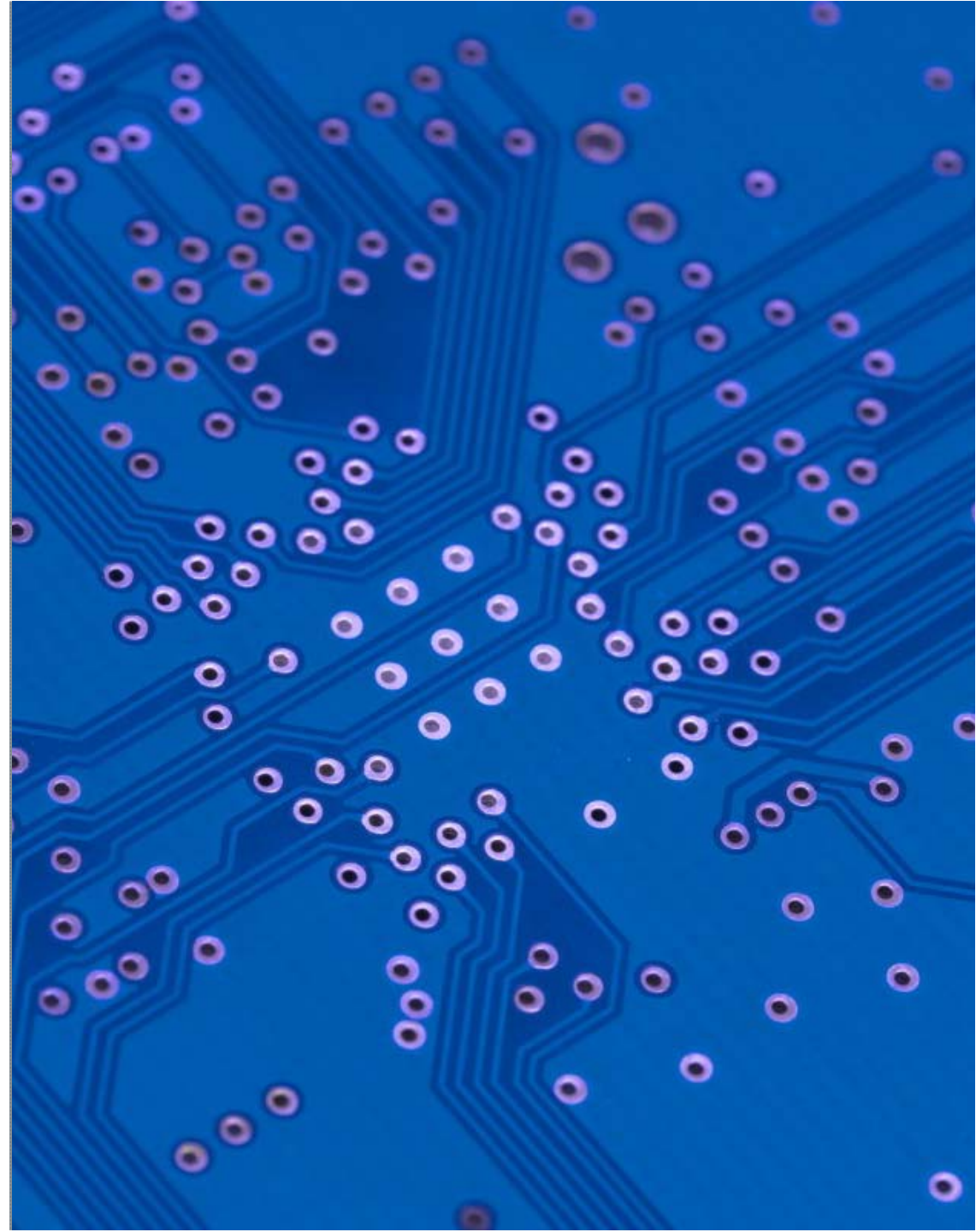No change of Pattern => start to fail/inevitably fail

70%

⚛ **POTENTIALLY PRE-CURRICULAR**
Compare the mismatch in time (appear very early in the time pattern)

31%

⬡ **ITERATIVE PATTERNS**
A failure does not always imply a stop in the training process; but more a pause

CONCLUSION

Can we build an algorithm to reduce the mismatch level?

What will be its impact?

In other words, typical inference question => what will an x level of dropout reduction have on :

$\Rightarrow$ Education efficiency

$\Rightarrow$ For what it takes, adhesion to educational programs

We have the patterns

We have the regressors

Further data to answer the inference question & measure the statistical adequacy of this pathway…