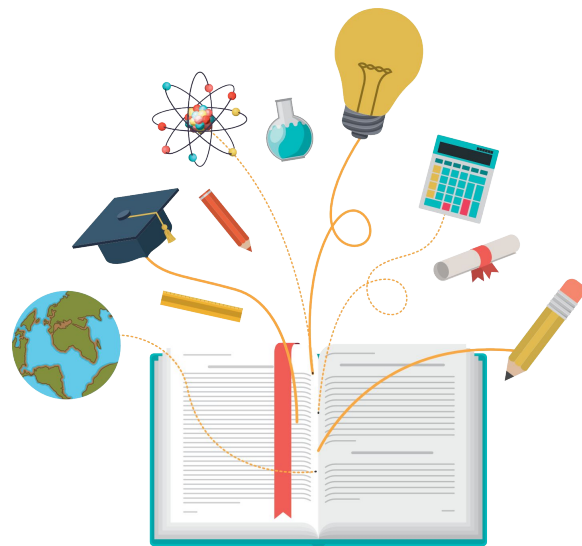




More than a Word Cloud Text Analysis in Python

Presented by Kevin Chang

Former Research Analyst @ AEST



Kevin “Kai” Chang



A decade of experience in Higher Education

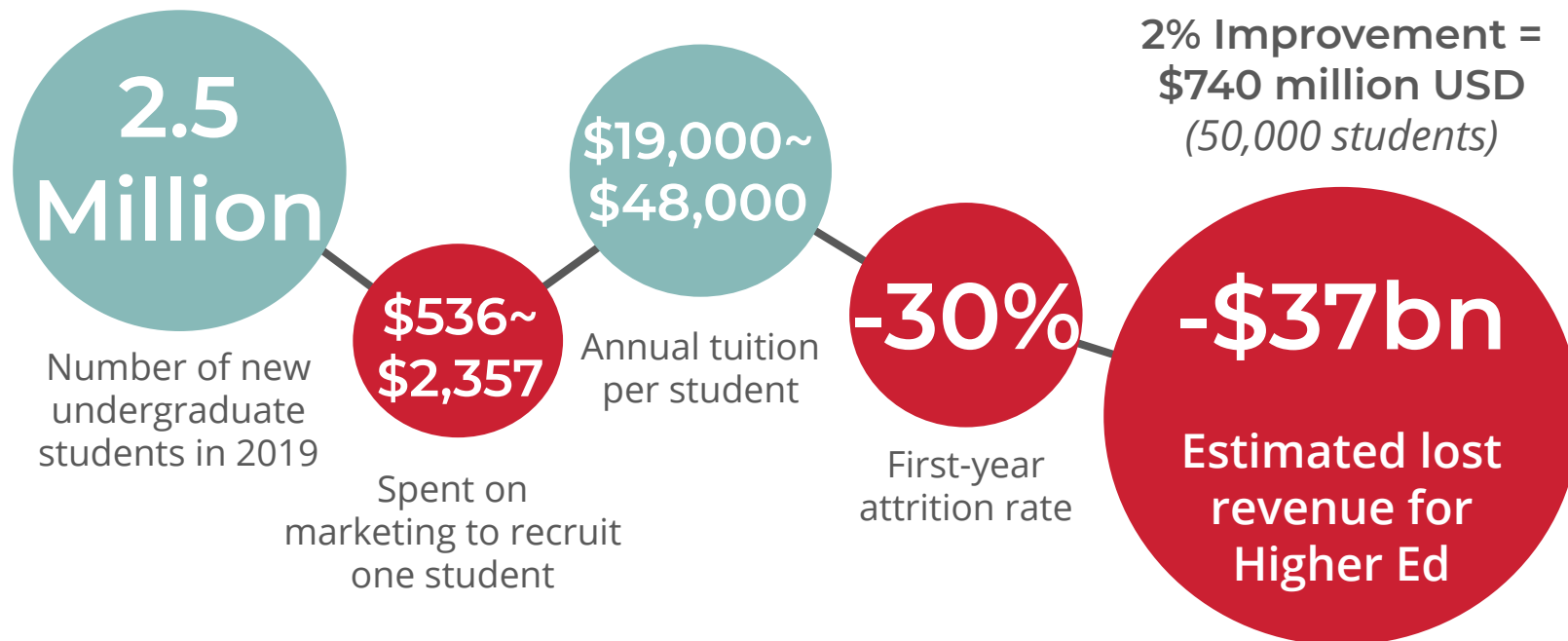
- Former analyst at BC Government AEST
- Founder and CEO at Kai Analytics
- Director of Institutional Research and Planning
- Accreditation and Audit team with WASC Senior College and University Commission

Agricultural Economist by training

- University of British Columbia (2009)
- University of Guelph (2012)



Cost of Student Attrition in the US



Source: United States, educationdata.org, and National Student Clearinghouse. Excl intl students.

The Canadian Perspective

Oh... Canada.

1.2
million

Total undergraduate student



16.6 million
Total undergraduate student



Effectively cluster ideas together

More than just a word cloud

Identify important differences



qualtrics

surveygizmo

Typeform

SurveyMonkey

explorance.

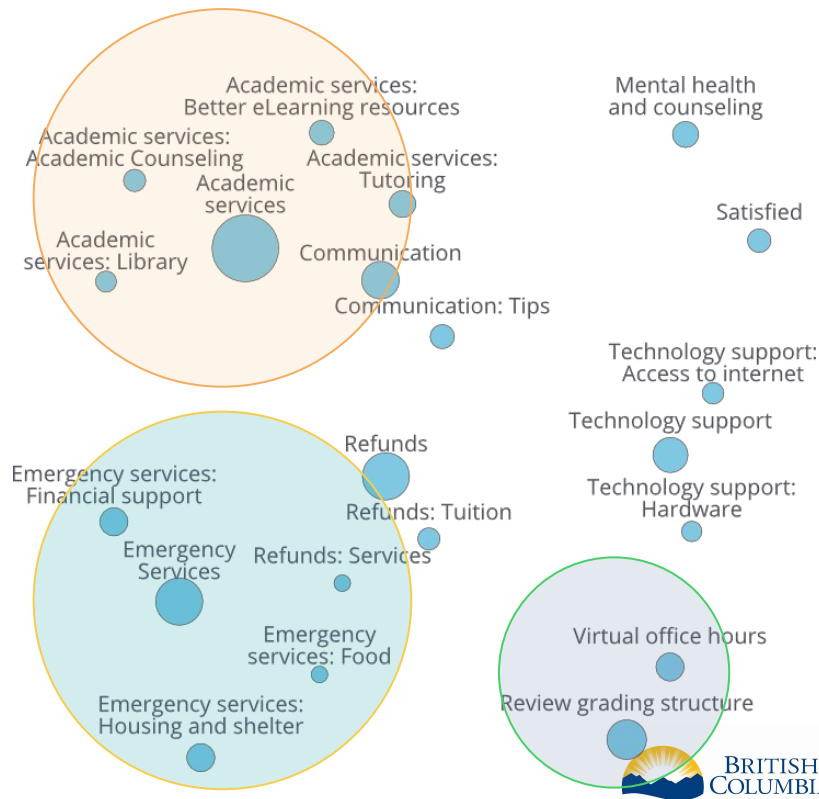
Building Integrations

Example: Mitigate the risk of attrition

Transition Management during COVID-19

"I would appreciate if my school would either **give us our money back** for the time we lost or **allowed us to do a pass-fail option** for our transcripts. Otherwise, I wish they would **allow academic counseling online** to determine how we move forward."

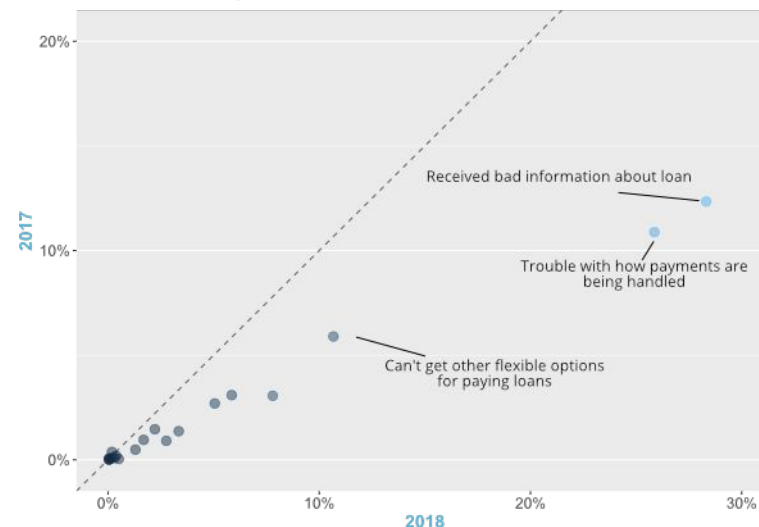
- First Year student, Texas



Example: Save Staff Hours

Date received	Product	Sub-product	Consumer complaint narrative
1/8/2019	Student loan	Federal student loan servicer	XXXXX refuses to accurately calculate the number of qualifying payments I have made on my student loan
2/20/2019	Student loan	Private student loan	My original lender was XXXX XXXX XXXX; this loan was considered a private loan that my parents took out to pay
3/5/2019	Student loan	Federal student loan servicer	I had to take out loans to attend college part time from XXXX.
1/19/2017	Student loan	Non-federal student loan	I had filed bankruptcy XX/XX/XXXX I was thinking I had gotten XXXX XXXX loan discharged due to XXXX issues. I h
1/14/2019	Student loan	Federal student loan servicer	PHEAA is harassing me claiming I have a loan with them. Over the last 12 months I've corresponding back and for
6/13/2019	Student loan	Private student loan	Last Year around XXXX, I received a letter from XXXX XXXX XXXX regarding a student loan- I sent a debt validation
2/25/2019	Student loan	Private student loan	In 2013 I consolidated ALL of my loans to make one bulk payment of (\$52000.00) to National Credit Services to
5/19/2019	Student loan	Federal student loan servicer	In addition to my TEACH Grants being wrongfully converted to loans in XXXX of XXXX, my loans have now been
1/9/2019	Student loan	Private student loan	I took out my XXXX XXXX loan in order to go to college. I was told when I signed up that I would get the best cust
12/20/2018	Student loan	Private student loan	Navient has continuously harassed, lied and pushed me into forbearance. I had my student loans with them sinc
12/28/2018	Student loan	Federal student loan servicer	applied for a loan consolidation with XXXX XXXX in XX/XX/XXXX because they already held a bulk of my graduat
6/20/2019	Student loan	Federal student loan servicer	I have been out of work for months now and Im not receiving any kind of income I just had a baby a few Months
2/23/2019	Student loan	Federal student loan servicer	I have three school loans taken out one that happens to be in XXXX (XXXX paid and XXXX balance) before I was t
4/4/2019	Student loan	Private student loan	This is regarding Navient. On XX/XX/19 I received my first phone call at XXXX, then again at XXXX, again at XXXX,
5/3/2019	Student loan	Federal student loan servicer	I've dealt with Navient XXXX XXXX XXXX many times starting from XX/XX/2019 to the current date (XX/XX/2019)
2/27/2019	Student loan	Federal student loan servicer	Case # XXXX was a prior issue that I had with XXXX. This Case was resolved because a review was completed of al
7/9/2019	Student loan	Federal student loan servicer	I have not received an accurate pay-off figure in writing for the debt I am being asked to pay. I have received a
2/25/2019	Student loan	Federal student loan servicer	I have been trying to reach Credit Adjustments Inc. by telephone for days. I dial the number and get a recording t
3/21/2019	Student loan	Private student loan	I co-signed on my husband's student loan with XXXX, when he graduated the loan was transferred to Firstmark.
6/24/2019	Student loan	Federal student loan servicer	I thought ALL of my student loans had been consolidated but one had not. I contacted Navient and was informed
7/12/2019	Student loan	Federal student loan servicer	I am applying for the XXXX time to have my student loans discharged since 2015 based on my total and XXXX. XX
5/25/2019	Student loan	Private student loan	I paid off our student loan back on XX/XX/2019 in the amount of XXXX.
6/27/2019	Student loan	Private student loan	General revenue services has been harassing me since XXXX. Two to 5 phone calls per day Monday through
8/28/2019	Student loan	Private student loan	In XXXX, I received a bill for (\$740.00) from Navient. On XX/XX/2019, I called and expressed my concerns for repa
7/17/2019	Student loan	Federal student loan servicer	I was not properly notified that my student loan repayments were to begin. I regularly monitor my credit score, i
7/9/2019	Student loan	Federal student loan servicer	Navient contacted my wife two weeks ago on her number leaving a message for me indicating I was 90 days past
7/13/2019	Student loan	Federal student loan servicer	I applied for and received federal student loans while I was in medical school. I made every payment on time
6/26/2019	Student loan	Private student loan	After recently requesting a "verification of debt" from Navient due to my account balances appearing to be
2/21/2019	Student loan	Federal student loan servicer	I object to the amount owed to the Department of Education. My original loan amount was (\$53000.00).
2/27/2019	Student loan	Federal student loan servicer	I have no idea what is happening to my student loans from XX/XX/2008. I originally had 2 loans when graduating
2/25/2019	Student loan	Private student loan	I was placed into a 1 Navient 1 payment plan I believe during XX/XX/XXXX and payments were made of (\$130.00)

Student Loan Complaints 2017 vs. 2018



Turning 1.5 million complaints into actionable insights

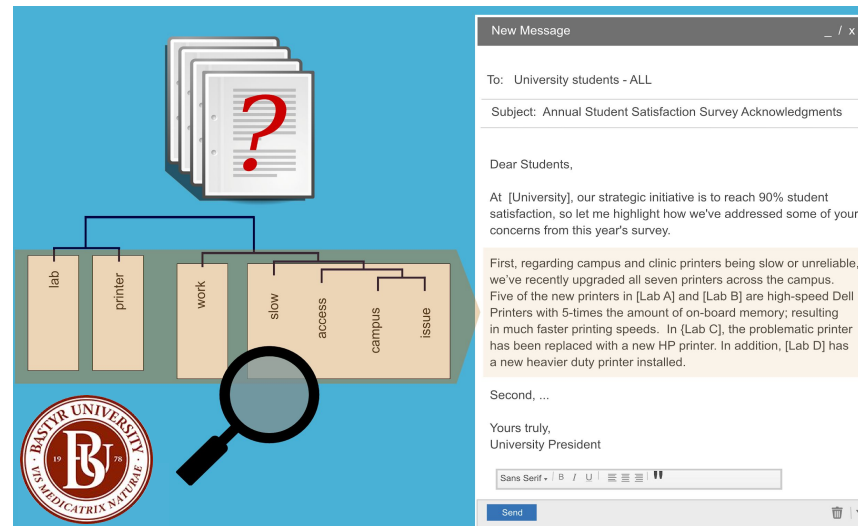
Source: US Consumer Financial Protection Bureau (CFPB)

Improve Student Satisfaction

Improved response rates to **59%**

Improved approval rates to **91%**

Overall attrition improved from:
8% to 4%



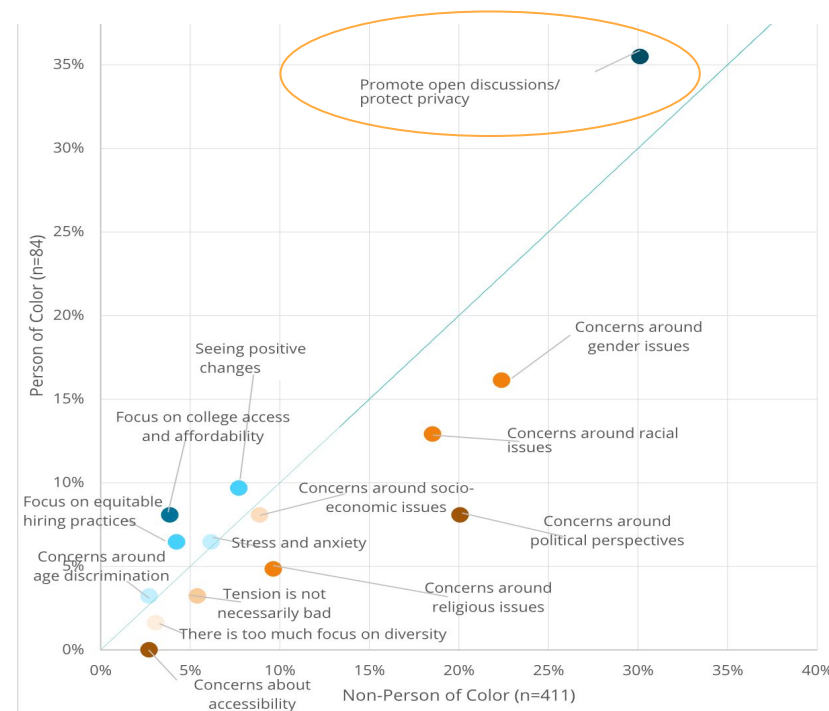
AN ESTIMATED **\$259,000** OF REVENUE SAVED
FROM A **4%** IMPROVEMENT IN RETENTION.

Source: Bastyr University Fast Facts: 2014-15 and 2015-16 Reporting Period. Annual tuition \$37,000 USD

A Positive Campus Climate

"Our next three-year plan will focus on promoting open discussion and protecting privacy"

- Associate Provost

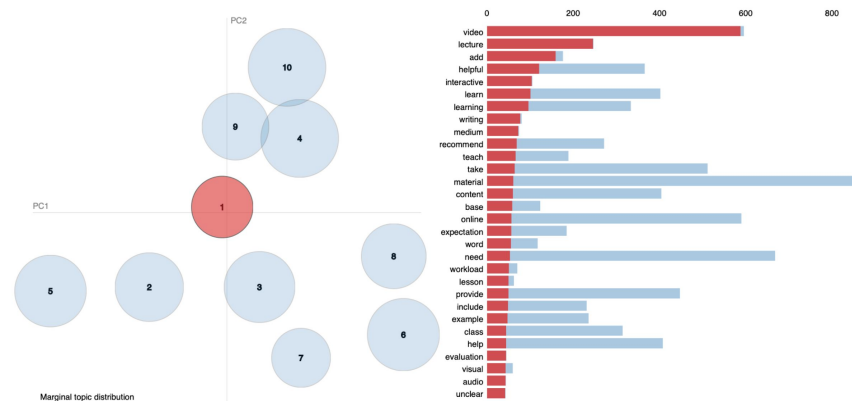


Topic Modeling

The task of using unsupervised learning to extract the main topics (represented by set of words) that occur in a collection of documents. These set of words are clustered within topics based on the similarity (closeness) in their semantics.

Further reading:

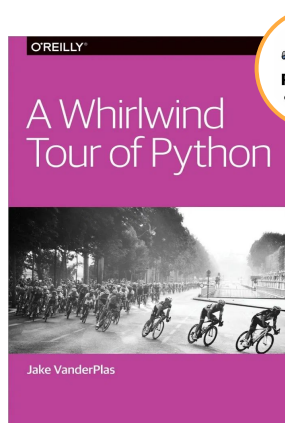
- Latent Dirichlet Allocation (LDA)
- Contextualized Topic Modeling (BERT)



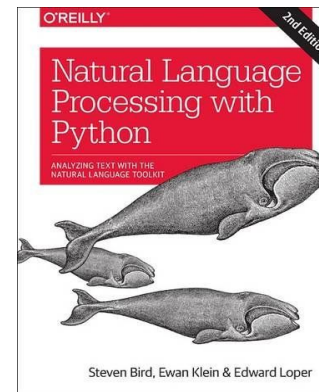
Some of My Best Practices

1. Do keep open-ended questions are succinct. Recommend ≤ 128 characters. Even better break comments by sentences.
2. Do run a spell checker early in your pipeline.
3. Do build custom dictionaries for institutional lingo, acronyms, terminology, etc.
4. The biggest category/theme might be the least interesting.
5. Do remove words with parts of speech tags (e.g. adverbs).

Additional Reading



Recommended by
my podcast
co-host
[@pythonoutloud](https://twitter.com/pythonoutloud)



Fasted-paced intro to essential features of python for folks with some coding experience

<https://jakevdp.github.io/WhirlwindTourOfPython/>

The first edition is free at:
<https://www.nltk.org/book/>

Thank You

Questions, Comments, and Suggestions?

Contact

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<https://www.linkedin.com/in/chang-kevin/>

Past Workshops

BC Institutional Research and Planning
May 2020 (Via Google Colabs):

www.kaianalytics.com/workshop

