

European Conference on
Academic Integrity and Plagiarism
(ECAIP)
June 09, 2021

Degrees of Deceit

Preliminary Findings

Jamie J. Carmichael, Carleton University, Ottawa, Canada
Sarah Elaine Eaton, University of Calgary, Calgary, Canada



We'd like to acknowledge the Indigenous Peoples of all the lands that we are on today. While we meet here on a virtual platform, we should take a moment to recognize the importance of the land on which we are each located. We acknowledge the territory to reaffirm our commitment and responsibility in building positive relationships between nations and in developing a deep understanding of Indigenous peoples and their cultures. Speaking as Canadians, we acknowledge the ancestral and unceded territory of all Inuit, First Nations, and Métis peoples.

Sarah Elaine Eaton & Jamie J. Carmichael





What you can expect

Transdisciplinary approach to the problem of academic fraud

Description of our research journey to date

Outline the design of our survey instrument
(Dataset 1)

Highlight key findings from the survey

Introduce the methodology of topic modeling
(Dataset 2)

Observations during web mining

Discussion of generated topics

Analysis of keyword co-occurrences

What's in store for us next...

Sarah Elaine Eaton & Jamie J. Carmichael



Our research journey



Started Summer 2020

This project materialized due to a collaboration on a webinar about admissions fraud and fake credentials within higher education in Canada. In researching for this event, we became aware of the lack of academic literature on this topic despite its appearance in early literature dating back to 1883. The notion of diploma mills or “the sheepskin shop” was highlighted as tainting education (Thompson, 1883, pg. 256). However, diploma mills frequently appear in the media as organizations that manufacture qualifications for a price. This discovery was the starting point for the project. This presentation, specifically, will focus on two data sets collected to further understand the problem through the distribution of a survey; and web-mining.

Sarah Elaine Eaton & Jamie J. Carmichael



Survey design

A survey was distributed to professionals working in admissions and registrarial services within post-secondary institutions and academics participating in hiring committees . Qualtrics was the survey platform used , and there were sixty-six mixed format questions. A hundred respondents ($N = 100$), primarily from Canada, responded to the survey. There were two respondents who indicated they were outside of Canada, but they reside in Canada now (Afghanistan and Antigua/Barbuda). Nine out of the thirteen provinces and territories were represented, which provides a data sample from coast to coast within Canada.





Key findings from the survey

Confidence level

Only 45.3% felt confident detecting fake documents, even though 67.7% received training. 87.1% stated they do not use an evaluation service to verify documents.

Workload

Workload issues reported for 90% of respondents and 79.4% felt that additional resources would help to more carefully review an admissions file.

Change

The topic of "admissions change" was frequently discussed amongst peers (83.7%).

"While we have found falsified and more often misleading academic records, the problem often comes to light 'after' a student has been admitted (sometimes when they are already attending). We also have applicants complete Personal Profiles, yet have few tools to determine what extent the writer has been coached (and if they applicant was really the author)." - Respondent





Frequency, security and digitalization

Frequency

88.7% have had cases of degree fraud or fake credentials. To break this down further: 1-20 cases (58.8%), 25-50 (19.6%), and more than 50 (21.5%). 61.1% involved undergraduate students, 5.6 % graduate students, and 33.3% involved both.

Security

84% had a detractor rating to the statement that blackmail was a probable outcome if a student engaged in this behavior. Similarly, a negative detractor rating was also indicated for the likelihood of a student hacking in to change their grade (91%), meanwhile, only 37.7% reported that they looked for grade anomalies via reports. 93.2% don't warn students about the dangers of posting a photo of their degree on social media.

Digitalization

Digitalization was earmarked as the way forward (e.g., Blockchain). However, it needs to be accessible and affordable to cross the globe consistently and impact change for the entire process. Adoption was noted as a barrier.



Impact on hiring and society

Information on hiring practices was also captured, and 63.6% check the credentials of those they are hiring. Attewell & Domina (2011) reported that people who fabricate credentials have often attended the post-secondary institution from which they are claiming to have the degree. Nevertheless, for whatever reason, they did not succeed at completing all the requirements for their program (Attewell & Domina, 2011).

We applied a concurrent mixed methods design to data collection. While the first data set examines our internal processes and responses to admissions fraud and fake documents, the second; explores thirty websites that sell fake degrees and credentials online.

Methodology: Web Mining & Topic Modelling

Thirty websites were found by searching “buy fake degree” on Google. This search query was not meant to quantify the number of services available but rather to use as a filter to isolate a subset of sites to analyze.

Data was manually scraped from the various layers of the website, from the elements to order the fake degree, the policies that police the business transaction, to how the service is justified or marketed to potential buyers. Automation was used to aggregate the layers. Over 28,000 unique data components were extracted.

The data was used to build a topic model. Topic modelling uses unsupervised machine learning to classify a grouping of words that are representative of the data in the corpus using a numerical value of frequency (Blei, Ng & Jordan, 2003).

Topic modelling allows a researcher to classify a large volume of data efficiently, and brings semantic patterns and trends to the surface that are worthy of investigation (Ambrosino et al. 2018; Blei, Ng & Jordan, 2003).

Sarah Elaine Eaton & Jamie J. Carmichael





Observations during web mining

- SPAM.
- Clients who don't pay have their names splashed on the site.
- Social media accounts are commonly suspended or terminated.
- You can buy an "identity": degrees, transcripts, certification, government documentation (e.g., driver's license, birth certificate, passport), letters (e.g., acceptance, reference or employment).
- Beyond tangible products: student email account; or within 24 hours, have your name appear in the graduation database.
- Thesis writing (connection to contract cheating).
- Take employee names off legitimate university websites for the fraudulent sites.
- Feature news stories with the services names hijacked in the text.
- One website provides reviews of the top fake credential services.

Topic Model

Nine topics explored

Topic modeling involves a number of steps, from meticulous data scraping to pre-processing the text in preparation to build the model. This presentation will not go into detail on the various processes utilized, but will highlight the results of our preliminary model to provide a snapshot of how these services function. This snapshot provided a narrow lens, with further opportunity to expand and learn more about subtopics. The model was created using a web interface, and a topic model genism (i.e., Python library) (Carmichael & Weiss, 2020). Four models were run simultaneously to analyze keywords that replicate across the models (Carmichael & Weiss, 2020). This can give the researcher clues and is similar in nature to a concept map.

Generated topics

Words tell a story about fake degree and credential services...


Interesting keywords are denoted in red.

Run	Topic Model 1	Topic Model 2	Topic Model 3	Topic Model 4
0	school high diploma option review contact email find choose proof	seal paper type size foil hologram silver department design color	state product site purchase website company service law grade pay	student degree year education course state major program art academic
1	best paper quality security printed size custom professional year price	student job education year tuition study program course art academic	day customer shipping chinese service cover malaysia color gpa free	diploma transcript school high novelty option realistic template paper size
2	fake diploma university degree transcript buy college certificate online job	embossed science gold school graduation list buydiydiploma signature michigan wisconsin	order sample form major canada help hong kong policy guarantee	embossed seal bachelor gold master management study contact type printed
3	student science state tuition management blue engineering hong kong technology	school high diploma novelty quality website copy form check contact	student business science master art card red bachelor western campus	hong kong buydiydiploma science honor computer wisconsin marquette level view

Run	Topic Model 1	Topic Model 2	Topic Model 3	Topic Model 4
4	certificate study work medical academic experience law sell certification skill	review product customer work email proof site day service company	seal design review contact check management email proof printed size	job review time graduation proof replica help email friend better
5	order novelty real document product form copy shipping day diploma	transcript option state card security cover law grade united payment	transcript embossed gold choose paper security international silver buydiydiploma parchment	design site sample document choose check real quality novelty custom
6	embossed seal design template gold diploma canada list foil silver	chinese engineering malaysia gpa honor delivery administration satisfaction package ielts	fake university diploma degree buy certificate transcript college online best option	order website product service form day customer shipping company option
7	service website business sample customer graduation major art company grade	order printed document custom shipping hong kong time day change	diploma school high fake novelty option college real quality template	fake university diploma degree buy certificate college online best find
8	site cheaper check chinese malaysia gpa honor western charge michigan	fake diploma university degree buy certificate college online transcript bachelor	degree job education work bachelor tuition course year study program	tuition chinese international engineering malaysia color gpa class comment family



Keyword co-occurrences



Semantic patterns

Keywords that duplicate in three or more models across a given topic are keyword occurrences (Carmichael & Weiss, 2020). This calculation is achieved by applying a Jaccard distance measurement within the algorithm (Carmichael & Weiss, 2020). The weighting is displayed in the form of color: Yellow = appears in all runs and the ratio is greater than or equal to two. Green = same ratio as yellow, but the keyword doesn't exist in all runs. Blue = displays in some runs, but has a ratio of less than two (Carmichael & Weiss, 2020).

Analysis of keyword co-occurrences

Results: Yellow = 14, Green = 10, Blue = 5. The keyword co-occurrences were as expected, except for topic 8, where "chinese" and "malaysia" were denoted in blue. Are these services more prominent in Southeast Asia or is this an outlier in the data? Other geographic locations also appeared, but did not replicate: Michigan, Wisconsin, Hong Kong, and Canada.

0	1	2	3
0 school	school	diploma	diploma
1 high	high	school	transcript
2 diploma	diploma	high	school
3 option	novelty	fake	high
4 review	quality	novelty	novelty
5 contact	website	option	option
6 email	copy	college	realistic
7 find	form	real	template
8 choose	check	quality	paper
9 proof	contact	template	size

0	1	2	3
0 best	scal	transcript	hong
1 paper	paper	embossed	kong
2 quality	type	gold	buydiydiploma
3 security	size	choose	science
4 printed	foil	paper	honor
5 size	hologram	security	computer
6 custom	silver	international	wisconsin
7 professional	department	silver	marquette
8 year	design	buydiydiploma	level
9 price	color	parchment	view

0	1	2	3
0 fake	fake	fake	fake
1 diploma	diploma	university	university
2 university	university	diploma	diploma
3 degree	degree	degree	degree
4 transcript	buy	buy	buy
5 buy	certificate	certificate	certificate
6 college	college	transcript	college
7 certificate	online	college	online
8 online	transcript	online	best
9 job	bachelor	best	find

0	1	2	3
0 student	student	student	student
1 science	job	business	degree
2 state	education	science	year
3 tuition	year	master	education
4 management	tuition	art	course
5 blue	study	card	state
6 engineering	program	red	major
7 hong	course	bachelor	program
8 kong	art	western	art
9 technology	academic	campus	academic

0	1	2	3
0 certificate	transcript	degree	job
1 study	option	job	review
2 work	state	education	time
3 medical	card	work	graduation
4 academic	security	bachelor	proof
5 experience	cover	tuition	replica
6 law	law	course	help
7 sell	grade	year	email
8 certification	united	study	friend
9 skill	payment	program	better

0	1	2	3
0 order	order	order	order
1 novelty	printed	sample	website
2 real	document	form	product
3 document	custom	major	service
4 product	shipping	canada	form
5 form	hong	help	day
6 copy	kong	hong	customer
7 shipping	time	kong	shipping
8 day	day	policy	company
9 diploma	change	guarantee	option

0	1	2	3
0 embossed	embossed	seal	embossed
1 seal	science	design	seal
2 design	gold	review	bachelor
3 template	school	contact	gold
4 gold	graduation	check	master
5 diploma	list	management	management
6 canada	buydiydiploma	email	study
7 list	signature	proof	contact
8 foil	michigan	printed	type
9 silver	wisconsin	size	printed

0	1	2	3
0 service	review	day	design
1 website	product	customer	site
2 business	customer	shipping	sample
3 sample	work	chinese	document
4 customer	email	service	choose
5 graduation	proof	cover	check
6 major	site	malaysia	real
7 art	day	color	quality
8 company	service	gpa	novelty
9 grade	company	free	custom

0	1	2	3
0 site	chinese	state	tuition
1 cheaper	engineering	product	chinese
2 check	malaysia	site	international
3 chinese	gpa	purchase	engineering
4 malaysia	honor	website	malaysia
5 gpa	delivery	company	color
6 honor	administration	service	gpa
7 western	satisfaction	law	class
8 charge	package	grade	comment
9 michigan	telts	pay	family

Concluding thoughts

These websites are accessible and affordable based on our in-depth examination of thirty websites. A four-year degree for an international student could cost upwards of \$160,000 in Canada. However, a made-to-order degree can cost anywhere between \$150 to 200 US dollars online. The same attributes of accessibility and affordability were gaps that surfaced in the survey with the prospect of technology to combat fake credentials. Further data triangulation between datasets will be explored.

Our objective in collecting this data was to learn about such services in order to compare them with currently applied solutions or those being considered for the future.

In summary, our research confirms the vulnerability to admissions fraud and fake credentials within higher education in Canada as the services available are manufacturing machines with a dark underbelly. It also shines a spotlight on a larger academic fraud network that connects admissions fraud, contract cheating and other nefarious means (i.e., hacking) to unethically get ahead.

Sarah Elaine Eaton & Jamie J. Carmichael





What's in store for us next?

We will be releasing an edited publication on fake degrees and credentials in 2022. We are hopeful that this book will address the scholarly gap in this research area. This book will showcase authors from different countries, and include: scholars, higher education professionals, education leaders, and a retired FBI agent. Stay tuned!

For more info about this project contact us:

Jamie J. Carmichael - JamieCarmichael@Cunet.Carleton.Ca

Sarah Elaine Eaton – seaton@ucalgary.ca

Sarah Elaine Eaton & Jamie J. Carmichael ©

References

- Ambrosino, A., Cedrini, M., Davis, B. J., Fiori, S., Guerzoni, M., and Nuccio, M. (2018). What topic modeling could reveal about the evolution of economics. *Journal of Economic Methodology*, 25(4), 329-348.
- Attewell, P., & Domina, T. (2011). Educational imposters and fake degrees. *Research in Social Stratification and Mobility*, 29(1), 57-69.
- Blei, D. M., Ng, A. Y. & Jordan, M. I. (2003). Latent Dirichlet allocation. *Journal of Machine Learning Research*, 3, 993-1022.
- Brown, G. M. (2006). Degrees of Doubt: Legitimate, real and fake qualifications in a global market. *Journal of Higher Education Policy and Management*, 28(1), 71-79.
- Carmichael, J., & Eaton, S. E. (2020). *Understanding the landscape of counterfeit credentials and university admissions fraud*. Paper presented at the Academic Integrity Webinar Series: Urgent and Emerging Topics - Taylor Institute for Teaching and Learning, University of Calgary, Canada. <http://hdl.handle.net/1880/112507>
- Carmichael, J. J. & Weiss, M. (2020). Topic model mash-up to uncover trends in contract cheating (Under review).
- Canva. (2021). <https://www.canva.com/>.
- SimpleScraper (2021). <https://simplescraper.io/>.
- Thompson, A. H. (1883). Present systems and the impending education. *The American Journal of Dental Science*, 17(6), 256-264.

