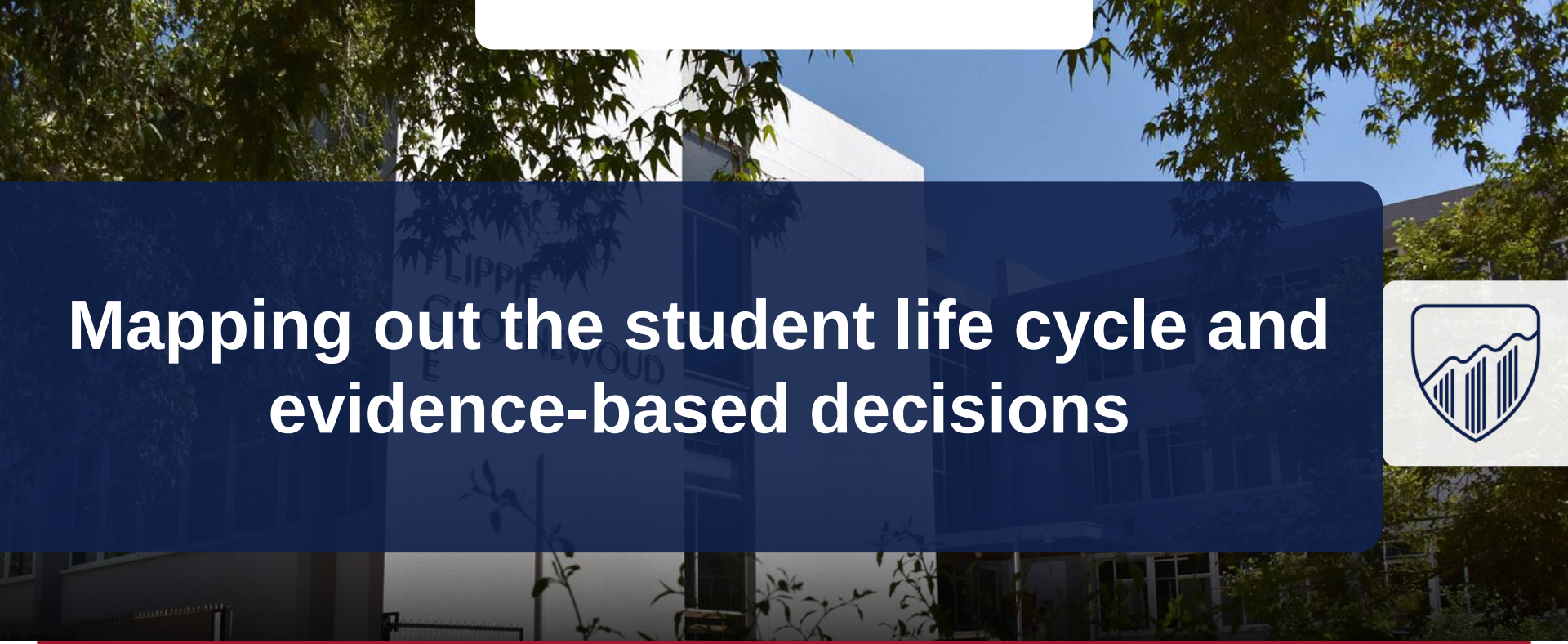

Mapping out the student life cycle and evidence-based decisions

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ECONOMIC AND MANAGEMENT SCIENCES

Meet the facilitators

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What is student lifecycle management?

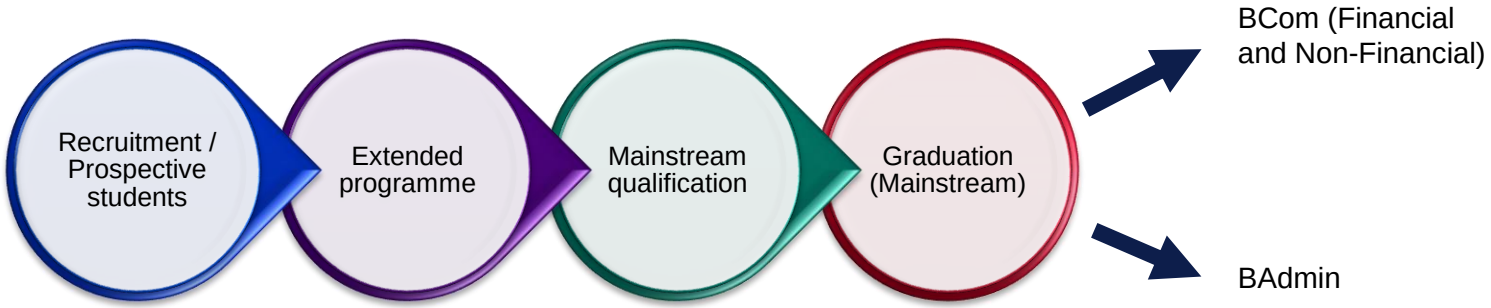
"The Student Life Cycle framework is used by educational leaders to help with support service analysis, prediction and planning, and can also be used to help design new and creative ways to improve first-year retention and student success."
(California State University; https://www.csusm.edu/successcoaching/program/lifecycle.html)

"Student lifecycle management is a data-driven approach of an educational institution that focuses on the entire student journey, right from the very first time the student becomes aware of the institution, through to admissions and then on to alumni." (Govender, 2020)

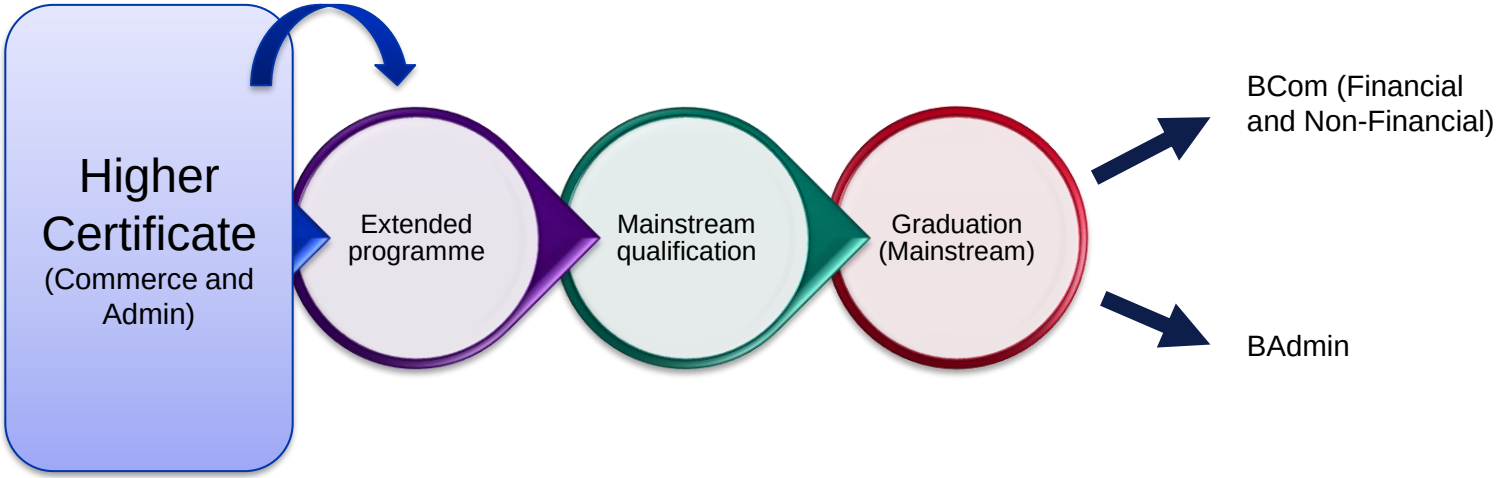
TL Office

- Admission & curriculum development
- Student support
- Marketing

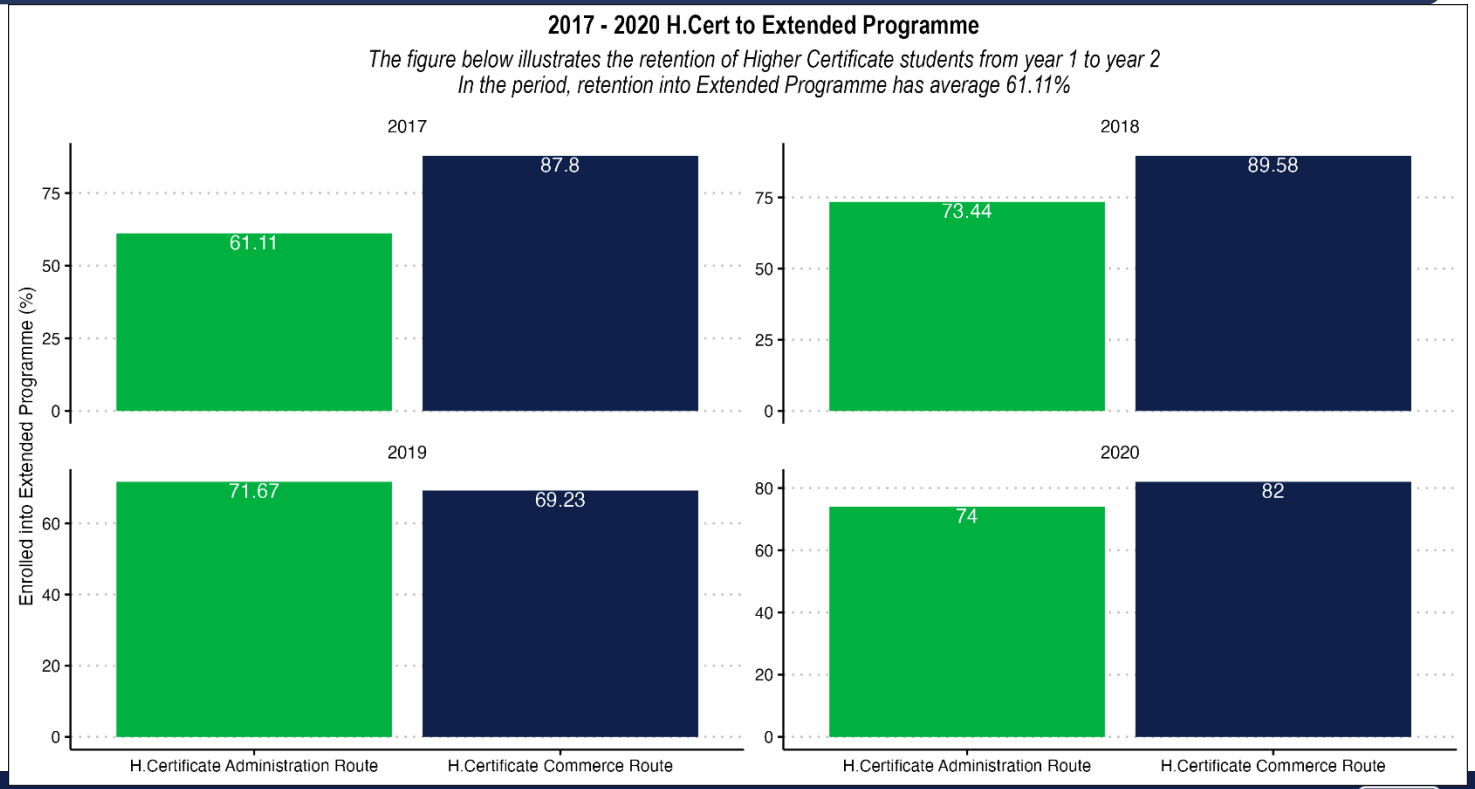
The typical life cycle…



HC as an access mechanism?



HC as an access mechanism?



Purpose of a HC (HEQSF)

Purpose and characteristics

This is an entry-level higher education qualification. The qualification is primarily vocational, with a strong industry-oriented focus. The qualification also serves to provide students with the basic introductory knowledge, cognitive and conceptual tools and practical techniques for higher education studies in their chosen field of study. It emphasises selected general principles together with more specific procedures and their application. This qualification signifies that the student has attained a basic level of higher education knowledge and competence in a particular field or occupation and is capable of applying such knowledge and competence in an occupation or role in the workplace. The Higher Certificate typically includes a simulated work experience or work-integrated learning (WIL) component.

Back to basics

Problem: HC as an access mechanism to a Bachelors degree…Access **with** success OR access **vs** success?

Aim and purpose:
To determine whether students entering the HC programmes successfully progress to and graduate with a relevant mainstream qualification from the EMS faculty to inform decision-making

- PQM and enrolment planning
- Curriculum design
- Graduation,student support mechanisms / identifying students at risk
- Resource allocation and financial viability

Group discussion

- 10 minutes discussion time (leader, scribe and timekeeper)
- 5 minutes feedback per group

Please discuss the following and record your discussion on the google forms doc (the link will be provided once in your group)

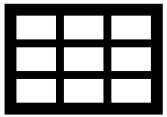
1. Which indicators are important in measuring the success of the Higher Certificate in light of the problem statement?
2. What analytics and/or tools would you need to convince decision makers that the higher certificate is or is not a mechanism for access to success in higher education?

Data Analysis and Results

DATA PREPROCESSING

Data-
Request
to DIRAP

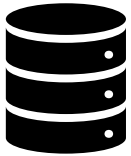
Microsoft
Excel
Dataset



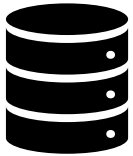
Data Cleaning in R:

1. {readxl} for importing data
2. {tidymodels} for normalizing numeric values and creating dummy variables
3. {mice} for multiple imputation by chained equations.
4. {parquet} for compressing student tables

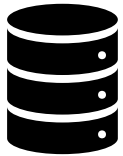
Entry



Academic progress



Graduation or
2022 status



DATA ANALYSIS

According to James et al (2021:461) survival analysis is analysis concerned with the *time until an event occurs*.

Survival analysis is applicable in several fields including medicine, business sciences, economics and higher education.

Kaplan Meier Plot

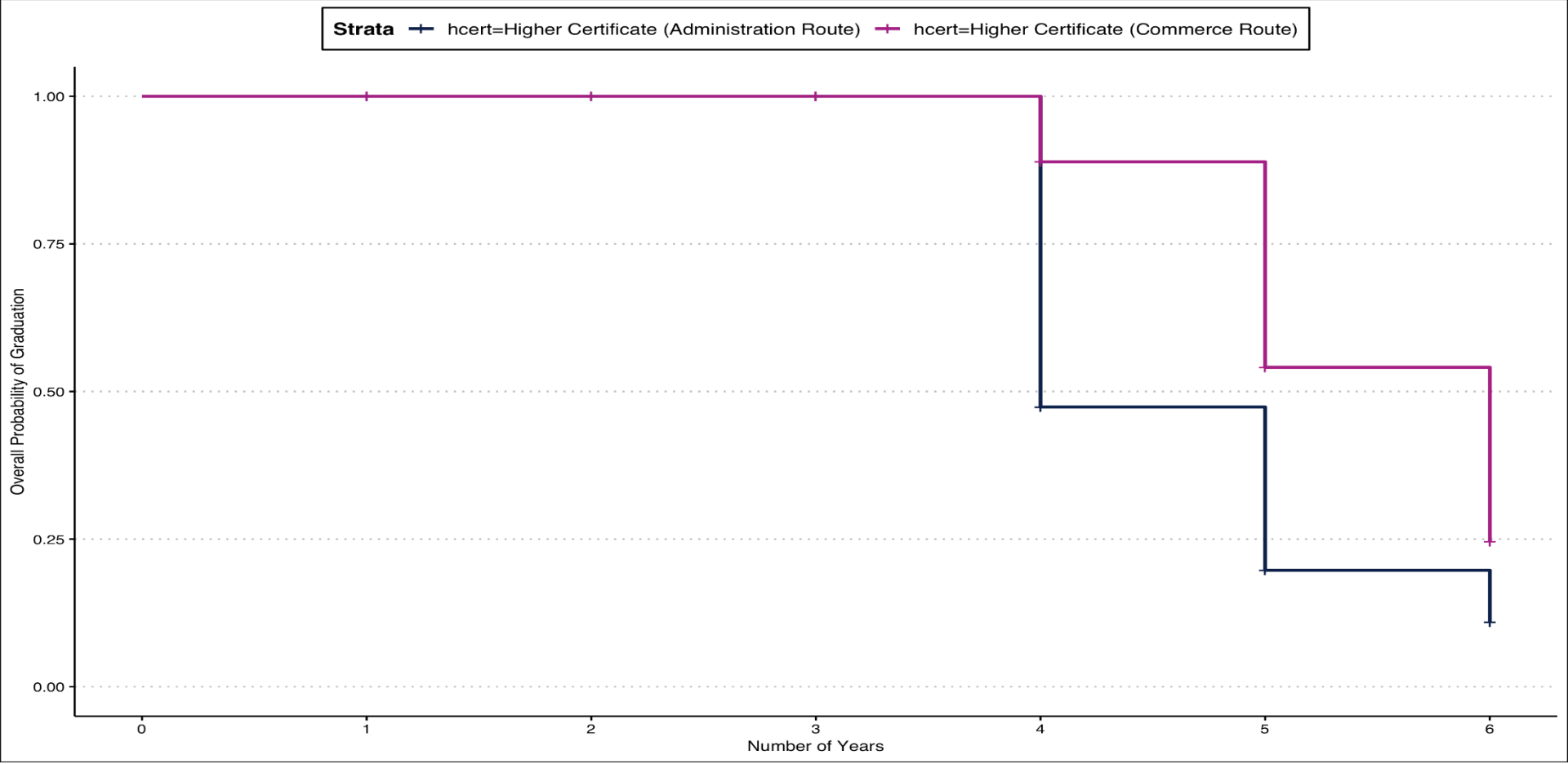
Life Tables

Cox Proportional Hazards Regression

Descriptive stats on Graduation

What pathway do the successful students follow?

Group	year	Registered Students	Graduated
Higher Certificate (Administration Route)	2018	128	0
Higher Certificate (Administration Route)	2019	94	0
Higher Certificate (Administration Route)	2020	93	0
Higher Certificate (Administration Route)	2021	90	33
Higher Certificate (Administration Route)	2022	50	8
Higher Certificate (Commerce Route)	2018	48	0
Higher Certificate (Commerce Route)	2019	43	0
Higher Certificate (Commerce Route)	2020	41	0
Higher Certificate (Commerce Route)	2021	38	3
Higher Certificate (Commerce Route)	2022	32	1

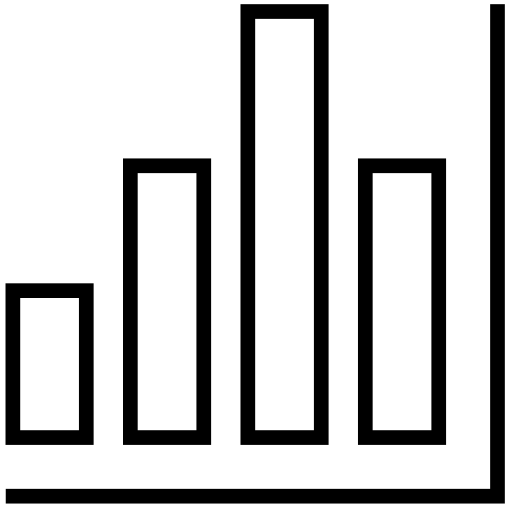

Strata
hcert=Higher Certificate (Administration Route)
hcert=Higher Certificate (Commerce Route)
1.00
0.75
0.50
0.25
0.00
Overall Probability of Graduation
0
1
2
3
4
5
6
Number of Years

DATA MODELLING

- Sample: HC students that successfully graduated with a Bachelors degree in minimum time (n=66 for 2017 and n=45 for 2018)

- Variable Selection:
  - *Penalized Regression for Cox Proportional Hazards Model (see Simon et al 2011)*

- Cox Proportional Hazards Model:
  - Model 1: All predictors,
  - Model 2: Variables extracted from Penalized Regression for Cox Proportional Hazards Model.



		Model 1			Model 2		
Characteristic	Event N	HR[1,2]	SE[2]	p-value	HR[1,2]	SE[2]	p-value
quintile_1	66	1.08	0.715	>0.9			
quintile_2	66	2.85	0.779	0.2			
quintile_3	66	1.13	0.574	0.8			
quintile_4	66	2.63*	0.482	0.045			
quintile_5	66	1.59	0.381	0.2			
ap_score	66	0.86	0.137	0.3	0.84*	0.088	0.047
academic_year_2017	66	0.43	0.514	0.10			
academic_year_2018	66	3.22	0.709	0.10			
academic_year_2019	66	0.92	0.841	>0.9			
academic_year_2020	66	1.13	0.314	0.7			
hcert	66						
Higher Certificate (Administration Route)		—	—		—	—	
Higher Certificate (Commerce Route)		0.53	0.438	0.15	0.32***	0.335	<0.001
mathematics * mathematics_subject	66	1.00	0.009	>0.9			
home_language * english_subject	66	1.01	0.006	0.4			
academic_year_2021					0.36***	0.183	<0.001

[1]*p<0.05; **p<0.01; ***p<0.001

[2]HR = Hazard Ratio, SE = Standard Error

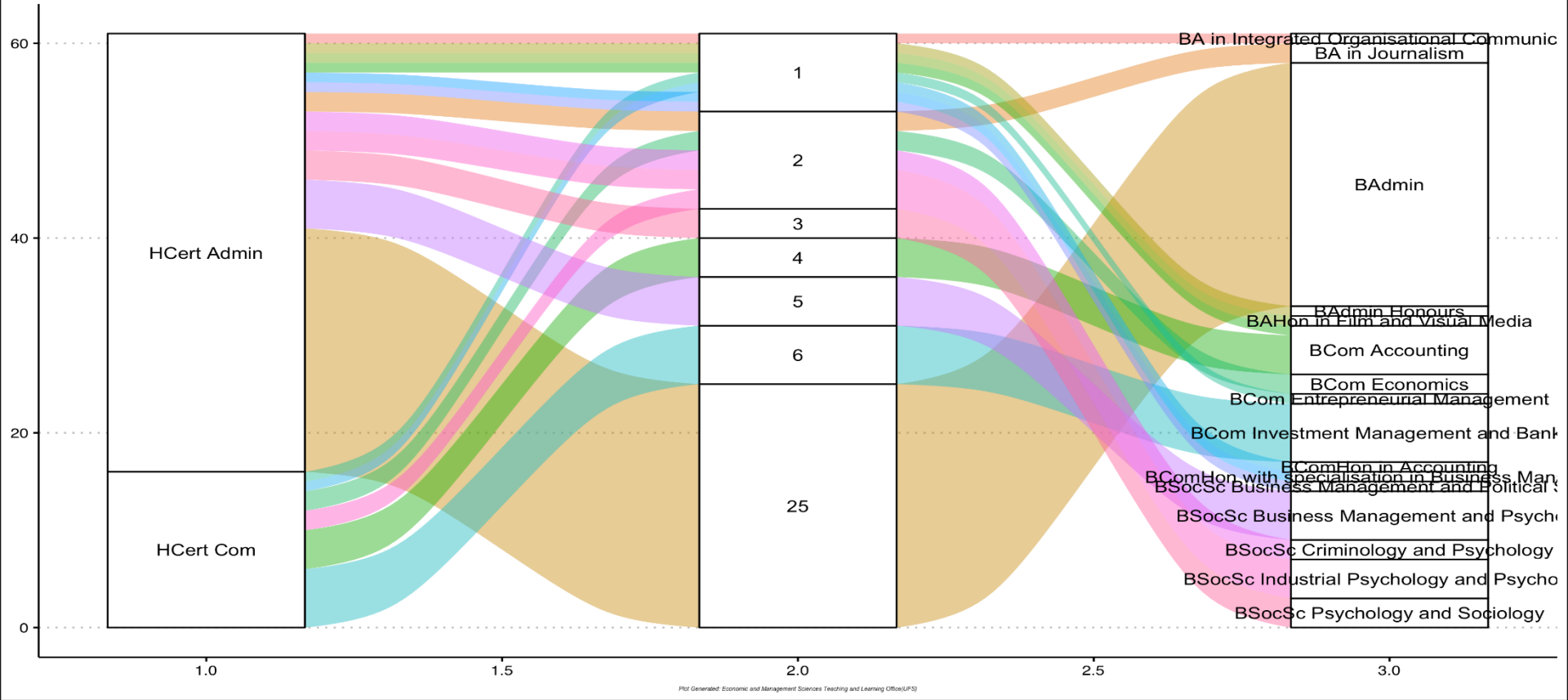
		Model 1			Model 2		
Characteristic	Event N	HR[1,2]	SE[2]	p-value	HR[1,2]	SE[2]	p-value
quintile_1	45	0.66	0.619	0.5			
quintile_2	45	0.89	1.08	>0.9			
quintile_3	45	2.14	0.527	0.15	2.17	0.496	0.12
quintile_4	45	1.14	0.795	0.9			
quintile_5	45	1.80	0.407	0.2			
ap_score	45	0.57*	0.248	0.023	0.63*	0.230	0.045
academic_year_2018	45	12.8**	0.98	0.009	7.79*	0.888	0.021
academic_year_2019	45	1.00	0.481	>0.9			
academic_year_2020	45	6.67	1.02	0.062	5.71	0.930	0.061
academic_year_2021	45	2.50	0.911	0.3	2.33	0.831	0.3
hcert	45						
Higher Certificate (Administration Route)		—	—		—	—	
Higher Certificate (Commerce Route)		0.44	0.645	0.2	0.31*	0.592	0.048
mathematics * mathematics_subject	45	0.99	0.009	0.5			
home_language * english_subject	45	0.99	0.008	0.14			

[1]*p<0.05; **p<0.01; ***p<0.001

[2]HR = Hazard Ratio, SE = Standard Error

2017 Cohort Graduation Routes

As of 2022, 61 graduations have been observed from the 2017 Cohort.
The majority (45) of graduates are from the Administration route of the higher certificates.
The remainder(16) are from Commerce route.



Plot Generated: Economic and Management Sciences Teaching and Learning Office(UFS)

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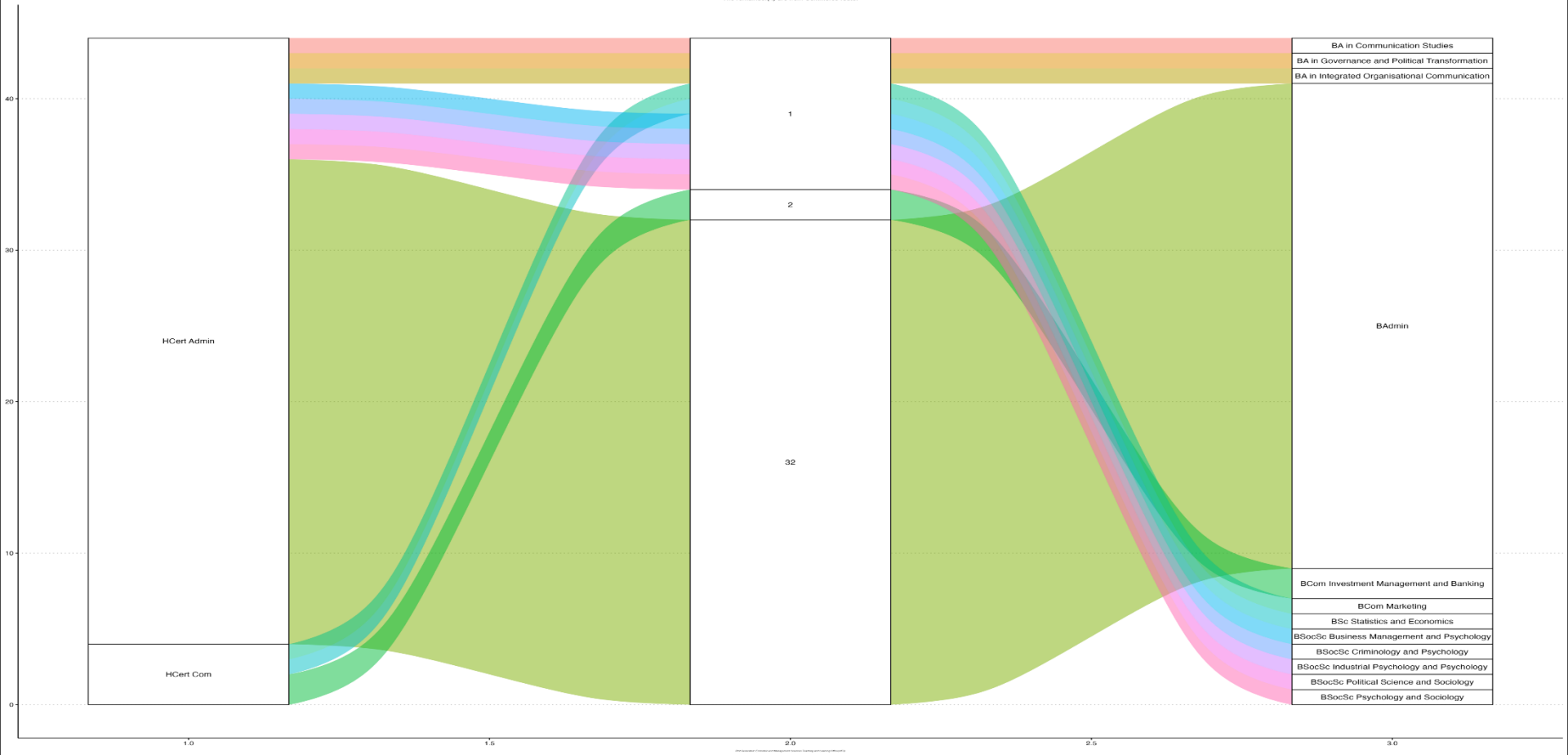
2018 Cohort Graduation Routes

As of 2022, 44 graduations have been observed from the 2018 Cohort.
The majority (40) of graduates are from the Administration route of the higher certificates.
The remainder(4) are from Commerce route.



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Summary

- From the regression analysis:
  - AP score
  - HC stream
  - Academic average in first year (2018 cohort) and also the final year (2017 cohort)

Which qualifications / academic careers are the successful students pursuing?

HC (Admin) – mostly BAdmin

HC (Commerce) – BA, BSocSci and BCom

Next steps

- Is the HC fit for purpose? Financial sustainability analysis?
- Enrolment targets: Where do we want to grow?
- Academic advising: Help students to identify the appropriate academic career
- Graduation rates: At risk student identification and focused support
- Enrich with qualitative data targeted at current students and alumni, add online activity data, funding status of students
- Curriculum design
    - Interdisciplinary HC?
    - Quantitative skills development to improve graduation rates

Thank you