A quantitative analysis of Chinese student success: Statistically examining the past to plan for the future

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University of Manitoba
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An assessment of the Academic English Language Program for University and College Entrance (AEPUCE)

1. Background (University of Manitoba and the English language program)
2. Study objectives
3. Statistical Methods and Data
   - Chinese (A and IN)
   - L5 UM
4. Results
   - Statistical analysis of Graduation (A vs. IN) and GPA
5. Discussion
UNIVERSITY OF MANITOBA

• Founded in 1877
• Research intensive (U15), medical doctoral university
• 29,181 students including 4,185 graduate students
• 11.2% international students from over 100 countries
ENGLISH LANGUAGE CENTRE

• Intensive Academic English Program
• Part-time courses for students in degree study
• CanTEST® (Canadian Test of English for Scholars and Trainees)
• SpeakEASY – Speech tutorials for professors
• Homestay Program
INTENSIVE ACADEMIC ENGLISH PROGRAM

• Five levels
• Averaging 220-260 students per term
• 24 hours per week for 14 weeks of instruction
• Program starts September, January, and May
• 40 to 50% of students are in Level 5
• 25 to 30% of students are in Level 4
AEPUCE LEVEL 5

• AEPUCE - Academic English Program for University and College Entrance
• Meets the language requirement for Universities of Manitoba and Winnipeg, and Red River College
  – taught at all three institutions
• Has a class size limit of 12
• Successful completion is determined by 65% in course work and tests in each of the four skill areas taught separately
• Has a successful completion rate of 90%
STUDY OBJECTIVES

• To assess differences in “academic performance” between Chinese students who were enrolled in the AEPUCE level 5 program (A) and those that were not (IN)

  “Academic performance” defined as:
  i. The odds of completing a degree program within three, four, five or six years
  ii. GPA averaged over completed study period
      GPA = Grade Point Average,
      scores range from 0 to 4.5
1. **Survival analysis** was used to statistically assess the proportion of A and IN students who completed a degree program as a function of time ($\leq 6$ years)
   - Determine statistical significance ($p \leq 0.05$)
STATISTICAL METHODS

- **Survival analysis (definition):** Statistical method used to examine “mortality” as a time-dependent function.
- Time 1, all individuals are present
- At each time step the cumulative number that “leave” is reported
  - Those remaining are called “survivors”
- This method has commonly been applied to medical or ecological data
- **APPLICATION AS A TOOL TO EXAMINE ACADEMIC PERFORMANCE IS NOVEL!**
STATISTICAL METHODS

• Modification for academic student data:

i. Mortality = number of students that have completed a degree program or have dropped out

ii. Survivors = those that have not left (over the stated study period)
• Graph “mortality versus time”:
  - At time 1, all individuals present (0% “mortality”)
  - At time \( n \), the number of individuals who have left will be greater than zero
  - Multiple statistical comparisons possible
• In this study the number who have left will be identified as the proportion of students who have successful completed a degree (at a given year)
STATISTICAL METHODS

• Assumptions:
  1) Single cohort (individuals from time 1 should be similar)
  2) Groups created using the cohort must be approximately of equal size (50:50 ratio)

• Thus we needed to select a single cohort (defined by admission year) that had nearly 50% A (AEPUCE) students and IN (non-AEPUCE) students
PERCENT OF CHINESE STUDENTS ADMITTED TO AEPUCE – L5

2007 cohort

Academic years (2002 - 2012)
PERCENT OF CHINESE STUDENTS ADMITTED TO THE AEPUCE – L5

Academic years (2002 - 2012)
WHAT ARE THE TRENDS IN THE 2007 COHORT DATA

1. How many have completed a degree?
2. Is there a difference between those who were enrolled in the AEPUCE program (i.e., the “A” students)?
RESULTS

2007 cohort \((n = 204)\)
RESULTS

2007 cohort \((n = 204)\)

\[\begin{array}{c}
A \\
\text{n = 103}
\end{array}\]

\[\begin{array}{c}
\text{IN} \\
\text{n = 101}
\end{array}\]
RESULTS

2007 cohort (n = 204)

A
n = 103

GRAD ≤ 6 yrs

IN
n = 101

GRAD ≤ 6 yrs

Incomplete

Incomplete
RESULTS

2007 cohort (n = 204)

A
n = 103

GRAD \leq 6 \text{ yrs}

64%

Incomplete

36%

IN
n = 101

GRAD \leq 6 \text{ yrs}

40%

Incomplete

60%
RESULTS

2007 cohort (n = 204)

A

n = 103

GRAD ≤ 6 yrs

64%

Incomplete

36%

IN

n = 101

GRAD ≤ 6 yrs

40%

Incomplete

60%

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DEGREE COMPLETION (2007 COHORT)
“Survival analysis”
Is there a difference in the rate of graduation?
PROPORTION THAT COMPLETED A DEGREE
(2007 COHORT)

ACADEMIC YEAR

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University
of Manitoba
PROPORTION THAT COMPLETED A DEGREE (2007 COHORT)

ACADEMIC YEAR

A (64%)

IN (40%)

P < 0.05
GPA COMPARISON
GPA (upon degree completion or 6 yrs)

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<th>GPA (upon degree completion or 6 yrs)</th>
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<td>GPA (upon degree completion or 6 yrs)</td>
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NO DIFFERENCE

NO DIFFERENCE

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GPA (upon degree completion or 6 yrs)

A (Grad vs non grad) SIGNIFICANT DIFFERENCE

2.81

IN (Grad vs non grad) SIGNIFICANT DIFFERENCE

2.78

1.9

1.82
CAN WE GENERALIZE THESE RESULTS?
RESULTS / DISCUSSION

• Small sample sizes is often a problem with single cohort studies

• How confident can we be about our results
  – Can we infer these results to the population (those who have enrolled since 2002)

• Statistical inference procedures (using t-distributions) were employed to assess the statistical confidence of our results
RESULTS / DISCUSSION

• The 2007 Rates of attrition, degree completion and GPA results were compared using the 2002-2006 pooled student data (for Chinese students)
• In all cases the pooled 2002-2006 results were within the 95% confidence limits of the 2007 cohort.
• This provides statistical evidence that the 2007 student cohort results were representative of the population
RESULTS / DISCUSSION

COMPARISON WITH CANADIAN STUDENTS (2007)

• Canadian Students enrolled at the University of Manitoba (2007), \( n = 3,584 \)
• Proportion that completed a degree within six years 36%
• Mean GPA = 3.3 ± 0.54
DEGREE COMPLETION (2007 COHORT)
“Survival analysis”
How different are the trends of Chinese students compared to Canadian students?
PROPORTION THAT COMPLETED A DEGREE (COMPARED TO CANADIAN STUDENTS)

ACADEMIC YEAR

A (64%)
IN (40%)
CA (36%)

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PROPORTION THAT COMPLETED A DEGREE (COMPARSED TO CANADIAN STUDENTS)

- Canadian students were statistically more similar to the Chinese (IN) students

ACADEMIC YEAR

A (64%)
IN (40%)
CA (36%)
GPA COMPARISON
(Chinese (A vs IN) and Canadian)
GPA (upon degree completion or 6 yrs)

A (Grad vs non grad)
1.9
2.81

IN (Grad vs non grad)
1.82
2.78

Canadian (Grad vs non grad)
2.17
3.3

NO DIFFERENCE
NO DIFFERENCE

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University of Manitoba
IMPLICATIONS OF STUDY AND FURTHER WORK
RESULTS / DISCUSSION

• Language proficiency tests only test for language. What else do full time EAP programs provide?
  • Academic Skills
  • Attributional Retraining (Dyck & Schonwetter, 2002)
  • Early Inclusion

• What are the implications for NES students?
Questions?

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