Exploring learning city inclusion with diverse education data

Prof Catherine Lido & Rachel Cassar (RA)
What can Psychologists tell us about Learning Inclusion?

- **Psychology** studies people- how they think, act, react
- **Social Psychology**- study of people in groups
- **Psychology of Adult Learning** &
  - Researching lifewide learning inclusion using novel data

• Catherine Lido
• Dr. Catherine M. Lido
• @CatherineLido
• @UofGEducation
• @urbanbigdata
#LifewideLiteracies
Multi-method Inclusion Research

- Social Identity & Social Capital frames
- Symphonic Social Science
- Blurring Boundaries
- City Information Modelling approaches

Students, choice, social mobility and higher education

Higher education (HE) participation is increasingly pervasive across the United Kingdom. Participation rates are at about 43 per cent of young people entering HE. Much of the debate over the last 10 years has focused on widening participation (WP) for young people from lower socio-economic groups, but, more recently, a debate has opened up, which focuses on how socially mobile our society is (Milburn, 2009; Clegg, 2011), and HE is seen to be a key component of creating upward social mobility.

Little (2006) points out that there is little evidence of the impact of student experience developing in institutions for students from non-traditional backgrounds, which highlights the need for further research. Meanwhile, Wolfers still highlight the importance of understanding the experiences of students from lower socio-economic backgrounds.

Recent government reforms have led to greater emphasis on widening participation, with the government setting targets for HE institutions to increase the proportion of students from disadvantaged backgrounds. This has led to increased focus on the importance of providing support and opportunities for students from non-traditional backgrounds.

The impact of engagement with extracurricular activities on the student experience and graduate outcomes for widening participation populations

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Abstract

HEI research, focused on widening participation (WP), has increasingly been linked to institutional strategies and policies. However, the impact of extracurricular activities on student experiences and outcomes is less clear. This paper explores the role of extracurricular activities in shaping student experiences and outcomes for WP students. Using a mixed-methods approach, the study examines the experiences of students from non-traditional backgrounds and identifies key factors that contribute to their success. The findings highlight the importance of providing support and opportunities for students from non-traditional backgrounds, with a focus on improving their engagement with extracurricular activities.
What is the Urban Big Data Centre?

- UBDC is a research centre that is jointly funded by the ESRC and the University of Glasgow.
- We promote the use of big data and innovative research methods to improve social, economic & environmental well-being in cities.
- We do this through:
  - World-leading Urban Research
  - Data Collection and Data Services
  - Teaching and Capacity Building
Educational Disadvantage & Place Team

Good Places – Happy Healthy Citizens

- Associations of Lifelong Learning & Place with…..
- Health
- Jobs
- Engaged Citizenry
- Longevity

Prof Mike Osborne
Prof Keith Kintrea
Dr Catherine Lido
Dr Muir Houston
Dr Phil Mason
Brittney Murphy
Barry Black
1) Place-based Inequalities in Attainment and Progression
2) Further Education: Fulfilling Its Purpose?
3) Inclusion in Higher Education
4) Inclusive Learning Cities
Learning Cities Agenda

- Aging population
- Growth in city dwellers
- Majority of pop. in urban environs (34% 1960 to 54% 2014, WHO)
- Challenges- social inclusion, technologies, knowledge economy, diversity & sustainability
- New skills/ competencies
- Transforming ‘learning cities’

Pascal International Observatory
UNESCO Features of Learning Cities

- **Wider benefits of building a learning city**
- **Major building blocks of a learning city**
- **Fundamental conditions for building a learning city**

**Sustainable Development**

- Inclusive Learning from Basic to Higher Education
- Revitalised Community Learning
- Effective Learning for and in the Workplace
- Extended Use of Modern Learning Technologies
- Enhanced Quality and Excellence in Learning
- A Vibrant Culture of Learning throughout Life

**Vision, Political Will & Commitment**

**Governance & Participation of All Stakeholders**

**Mobilisation & Utilisation of Resources & Potentials**

‘Lifelong Learning for All’

Empowerment & Social Cohesion

Economic & Cultural Prosperity
Ex. Learning City Indicators

1.1. **Empowering** individuals & promoting **social cohesion** (civic participation)

2.1. Promoting **inclusive learning** in education systems (all forms of learning, all ages & demographic groups)

3.3 Examining **literacies**, helping others to learn, **interventions & initiatives**…
Lifewide Literacies?

- Lifelong Learning
- Lifewide Learning
- Learning Cities
- Lifewide Literacies (UNESCO)
- Health
- Financial
- Eco
- Digital

"Lifewide Literacies is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society."

(UNESCO 2003, 1)
Transforming Learning Cities: Integrated Multimedia City Data (iMCD) Project @UBDC

• Open Data ‘Product’
  1. Survey- 1500 Households
  2. GPS Sensors
  3. Lifelogging Cameras
  4. Social Media Capture

Project Mngr:
Dr. Mark Livingston
‘Understanding Glasgow Survey’

Review of National/ EU Surveys + UNESCO Indicators

- Attitudes, literacies & Behaviours
  - Education/ skills
  - Sustainability
  - Transport
  - Cultural/ civic
  - ICT/ technology

- Stratified Random Postcode Sampling (Ipsos Mori)
  - n=2,095, 16-102 years (M= 49.42,SD=19), 45.7%Female, 54.3%Male
Education Questions

- Lifelong Learning
- Formal Learning
- Informal Learning
- Non-formal Learning
- Family Learning
- Attitudes towards Learning
- Literacies - English, Maths, ICT & Financial, Health, Eco
- Modes, Hours, Reason for study

The relationship between informal and formal learning
Education Measures Reviewed

• Existing survey measures incorporated include:
  • AES = Adult Education Survey (English Version)
  • ALLS = Adult Lifelong Learning Survey
  • BHS = British Panel Household Survey
  • Britsocat = British Social Attitudes Survey
  • CFLS = Consumer Financial Literacy Survey
  • NALS = National Adult Learning Survey
  • NIACE = National Institute for Adult Continuing Education
  • ONS = Office of National Statistics Survey
  • PIAAC = Programme for International Assessment of Adult Competencies
  • SLS = Skills for Life Survey
  • UNESCO = Open Educational Resource Survey
Transforming Learning Cities: Engaged older learners in Glasgow

Regression: Older adults engaged less in ALL learning types

1. Age (predicts all learning types)
2. Feeling Safe Walking at night
3. Sense of Belonging to area
4. Place - Local Authority

Engaged Older Learners = More physically mobile in cities

Measuring Lifewide Literacies

- **Financial Literacy**: Suppose you had £100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? would it Be …

- **Eco Literacy**: Ozone forms a protective layer in the earth's upper atmosphere. As far as you know, What does ozone protect us from?

- **Health Literacy**: How often, if at all, do you need to have someone help you understand instructions, pamphlets or other written material from your doctor or pharmacy?

- **Data Literacy**: ICT, Digital, Numeric, Informational

- **Cultural Literacy**, others?
Measuring Health Literacy

- Personal & social resources people need to access, understand, evaluate & communicate information- to make decisions about health (Beauchamp et al., 2015)
- A critical empowerment strategy

2 iMCD items- validated for single item use
  - ‘HOW OFTEN, IF AT ALL, DO YOU NEED TO HAVE SOMEONE HELP YOU UNDERSTAND INSTRUCTIONS, PAMPHLETS, OR OTHER WRITTEN MATERIAL FROM YOUR DOCTOR OR PHARMACY?’
  - ‘HOW CONFIDENT ARE YOU FILLING OUT HEALTH-RELATED FORMS BY YOURSELF?’.
Lifewide Learning in the City

Regression: Older adults engaged less in ALL learning types

• All lifewide literacies correlated neg. w/ deprivation (SIMD; p < 0.05)
• All (esp. health literacy) correlated with ‘proxy measures’ of precarity (e.g. people/rooms, income/ benefits, internet access p < 0.05).
• Precarity differences in lifewide literacies (more secure household tenure, stable employment & Scottish national (p < 0.05).
• Regressions presented to explore the predictive relationship of lifewide literacies to area & positive life outcomes, such as social engagement and general health.

Linear Regression

- Type of General Linear Modelling
- In Classical or Frequentist stats
- Where outcome to be predicted is normally distributed(ish); predictor any data ‘type’
- And relationship between variables linear(ish)
- \( Y = a + bx \) (or \( Y = c + mx \))

Outcome = intercept + slope by predictor(s)

- Simple- 1 predictor IV, 1 outcome
- Multiple- 2+ predictors, 1 outcome

- % variance (SS) explained for by our model vs. how much error?
- Look out for- outliers, multi-collinearity, patterns in your residuals (errors)

Navarro (2011). Learning statistics with R: A tutorial for psychology students and other beginners. (Version 0.6.1)
Results 2: Literacies, Area & Social Inclusion Predict General Health

• Literacies matter - Adj. $R^2 = 15.1\%$ ($p<.001$)
• & HL moderates EL

• Area-relationship matters - Adj. $R^2 = 7.5\%$ ($p<.001$)

• Social Engagement matters - Adj.$R^2 = 16.1\%$ ($p<.001$)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\beta$</th>
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<tbody>
<tr>
<td>Eco Literacy</td>
<td>.11***</td>
</tr>
<tr>
<td>Financial Literacy</td>
<td>.20***</td>
</tr>
<tr>
<td>Health Literacy$^1$</td>
<td>.35***</td>
</tr>
<tr>
<td>Area Rating</td>
<td>.18***</td>
</tr>
<tr>
<td>Area Belonging</td>
<td>.21***</td>
</tr>
<tr>
<td>Safe Walking at Night</td>
<td>.08**</td>
</tr>
<tr>
<td>Plans to Move$^2$</td>
<td>-.06*</td>
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</tbody>
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Moderated/ Mediated Regressions

- How presence of a third variable (Z) affects existing relationship between 2 other variables (X&Y)
  (e.g. indirect effect of confound or covariate)
- Mediator in middle (Grades-Self-Esteem-Motivation*)

- Moderator at start, like foot on accelerator
Using Glasgow Data to explore the power of Lifewide Literacies

Health Literacy mediates effect of Social Support on General Health

- Sobel test = 7.84, p < .001
Alternatives to Linear Regression

- Outcome variable is ‘discrete’, not continuous/ normally distributed
- Not based on linear relationship between variables
- Logistic/ Logit- outcome usually binary (e.g. pass/ fail)
- Can also be more- ordinal, multinomial
- Predictors still ‘any level’ of data
- Rather than using Ordinary Least Squares for ‘Model Fit’
- Takes log transformation of odds ratio & calculates:
  - Probability of DV event happening or not at different levels of the IV (Maximum Likelihood Estimation)
- Probit- also binary outcome, but re-introduces assumption of normality (continuum) for residuals
- As do Bayesian regression approaches...
DEMO TIME

• Read codebook
• Data cleaning/ changing
GPS- iMCD Movement Patterns

https://youtu.be/xzpRUuDjiO4

- Migration
- Disability & transport
- Housing
- Politics

-Seniors Understanding Sedentary Patterns project (Shaw et al 2017)
Twitter Dashboard

- UBDC iMCD Twitter Data Access Platform (http://tweets.ubdc.ac.uk)
- Bespoke tool facilitating simple analysis & acquisition of Twitter Social Media data,
- Compliant with the terms and conditions of the Twitter platform that prohibit sharing of original tweet content.
- Filter our corpus of 2.9TB+ of twitter data by time, place or keyword
- Retrieve statistical insights AND download original tweet IDs.
- IDs can be “hydrated” using a third party tool to retrieve tweets directly from Twitter’s API (excluding content that no longer exists or has restricted access)
- AVAIL Functions- sample tweets, basic statistics of the data, & interactive map with the choice to have a look at the density of tweet activity on a specific region & aggregated sentiment scores of the associated tweets.
- Finally, it gives the opportunity to the users to download a subset of the data and work on it independently of the platform.
- E.G. TERMS/ Concepts-
IMPACT: Knowledge Exchange (@Ikea)
Data Lessons from iMCD?

• Data Literacy (Empowerment) #LifeinData
• Start from # but end w/ holistic pictures
• Lived experiences
• Break quant/ qual divide
  • Triangulation
  • Interdisciplinarity &
  • Impact
• GDPR- privacy tensions with open data
Can @UrbanBigData help you with your education research?

- Data - iMCD, FE, HE?
- Skills training?
- Future funding collaborations?