Triangulating Novel Mixed-Method Educational Data for Effective, Evidence-Informed Policy Impact

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Urban Big Data Centre
In this session we will discuss

Data Triangulation & Impact for Knowledge exchange & Policy Change through 3 UBDC case studies:

- **EX 1 iMCD open data product**
  - Novel data linkages & regression
  - GIS mapping &
  - Searchable Twitter dashboards

- **EX 2 Gendered Journeys (inequalities in STEM)**
  - Secondary data
  - Motivational interviews
  - Digital Footprints & Social network analysis

- **EX 3 Social enterprise partnerships (Food Train for older adults)**
  - Secondary data
  - Surveys &
  - Lived experience Interviews
Who am I?

- Social Psychologist - Prof of Lifelong Learning
- Social Identity & Social Capital frames
- City Information Modelling approaches &
- Mixed-methodologies
- To explore Learning Inclusion

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What is the Urban Big Data Centre?
ubdc.ac.uk
@urbanbigdata

▪ Promotes use of big/ novel data & innovative research methods to improve social, economic & environmental well-being in cities

▪ Through:
  ▪ Data Collections & Data Services
  ▪ Data Science Teaching & Capacity Building
  ▪ World-leading & IMPACTFUL Urban Research

▪ Jointly funded Research Centre- ESRC & University of Glasgow
Educational Disadvantage & Place (UBDC)

PASCAL International Observatory- Learning Cities Network (Rob Mark)
Cultural Literacy & Education (Henrik Zipsane & Maggie McColl)

- Exploring Educational Inequalities Through a Lifelong Lens
- Evidencing Associations of Lifelong Learning & Place with….

- Health
- Economics
- Sustainability
- Engaged Citizenship
- Cultural Literacy & Education

Prof Catherine Lido
Prof Mike Osborne
Prof Keith Kintrea
Dr Muir Houston
Dr Phil Mason
Dr Emma Seddon
Brittney Murphy
Barry Black
Dr Nadiia Gorash (Data Scientist)
What is Research IMPACT?

• Please head to sli.do or slido.com (see chat box)
• Enter code #646733 (see chat box)

1. Type what ‘Research Impact’ means to you?
2. Should funding for tackling social challenges be based on impact?
3. How can we best measure or track real-world impact over time?

**ACADEMIC IMPACT**
Education programs and research outcomes

**COLLABORATIVE IMPACT**
Delivery of programs or products or services to the community

**SOCIETAL IMPACT**
Impact on the community from utilising the programs or products or receiving the services
Big Data may be numerically large or beyond the capacity of most relational database systems to manage. More significantly, it may be continuous (in real-time) with ongoing data collection, or it may be ‘big’ due to the complexity of the data themselves and the need for novel methods to capture, analyse, interpret and visualise. Data-sets are becoming bigger and more open, and it is important to tap into such resources to improve our knowledge of city-wide participation. (Lido et al. 2015, p. 494)
**Triangulation**

- ‘Comparing findings from > one perspective
- Multi-methods (within a paradigm)
- **Mixed-methods** (integrating paradigms)
  - Can be part quantitative – part qualitative
  - Experiment and survey (multiple-methods)
  - Survey and interview (mixed-methods)
- Secondary data as contextual
- One researcher with another…
Project Ex 1: Integrated Multimedia City Data (iMCD)

2015 project designed to address themes of **urban living**

Based in the Greater Glasgow region (1.2m population)

Integrates multi-mode data: person-level self-reported and sensed information, linkable to external data sources

A Big Data project, especially because of the **variety** of its data strands

Education research perspective:
- Attitudes, Literacies & Behaviours
  - Education/ skills
  - Sustainability
  - Transport
  - Cultural/ civic activity and engagement
  - ICT/ technology use
Household Survey: 2095 people / 1511 households

Travel Diary: 1509 people

GPS Tracking: 333 people

Lifelogging: 233 people

Activity Diary: 297 people

No travel: 586 people
**iMCD**

- *Household Survey*
- *Travel Diary*
- *GPS Tracking*
- *Lifelogging*
- *Activity Diary*

**Social Media**
- 64m tweets

**Secondary / Administrative Data**
- Linked at data zone/postcode unit level
  - *Neighbourhood deprivation*
    - Scottish Index of Multiple Deprivation
  - *Access to urban greenspace*
    - OS Open Greenspace & Open Street Map
Learning engagement, walking and greenspace

Learning: formal (for qualification), non-formal (not for qualification), informal (independent)

Deprivation: SIMD quintile

Greenspace access: within 10 min walk of e.g., parks, sports grounds, children’s play areas

Trying to understand complex patterns

1) Household Survey:
   Learning engagement is more likely if you live near greenspace (OR=1.27–2.16)

2) Household Survey + Travel Diary + GPS tracks:
   Learning engaged people generally walk more often (OR=1.68, 5-7 days per week)
   and for longer (21.4 vs 16.4 min), but not significantly so in greenspace

3) GPS tracks:
   Qualitative illustration. Maybe learning-engaged older women walk less in greenspace (more in the city centre) than the non-learning-engaged?

Lido et al., Integrated multimedia city data: exploring learning engagement and greenspace in Glasgow. 2020. Built Environment 46(4), 574-598
All-mobility patterns of learning-engaged (left) and non-learning-engaged (right) women aged 60+ years

3) GPS tracks:
Qualitative illustration. Maybe learning-engaged older women walk less in greenspace (more in the city centre) than the non-learning-engaged?
iMCD IMPACT - Movement Patterns

- Understanding Sedentary Patterns of Seniors (Shaw et al 2017)
- Lifelong Learning with Greenspace (Lido et al. 2020)
Is this ‘Impactful’ & How can we capture outcomes in communities?
Trajectories of STEM students and graduates through higher education and into employment, in India, Rwanda and the UK

- Mixed methods:
  - large-scale survey
  - secondary data analysis
  - interviews and focus groups

- Stakeholders in different countries and institution types:
  - universities
  - private and public STEM employers
  - state-level organisations

- International research for global impact:
  - national policy change
  - ‘toolkit’ for students, HEIs and employers in all contexts

- Broader impact = contribution to meeting sustainable development goals (SDGs 4, 5, 8, 9)
Networks of academic and non-academic stakeholders

Online (social) media engagement with stakeholders and beyond
VisNET- Vir
(Gauchotte-Lindsay, Mulvana & Lido, and team)

- Addressing Gendered
- 30 women STEM Early
- Longitudinal- Survey, \$
- Professional Networks
- Events, Policy Paper (Increasingly Unequal) & Nature Index on Inclusion

Longitudinal Mixed Methods
Incl. Ego Nets @ 3 time points

A. reliance on manager’s networks

B. Clustering in lab/group

C. Many unconnected individuals

GRADE OF ACADEMIC STAFF IN ENGINEERING
University Of Glasgow (2016)
Ex 3: Partnership Project (Reid & Lido)

**Ethical, inclusive, Kind**- Mixed Methods
- Standardised Survey Measures
- Qualitative Interviews
- Examined within national data on ageing

Capacity building to appoint fieldworkers

Researched in context

*During this research, we visited 41 individual research sites; home, lunch clubs, day centres, postal survey*
Demographic Summary
Average Age: 79.51 (8.15 SD), Ranging 58-98 Years

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<th>Variable</th>
<th>Response</th>
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<td>Prepare Hot Meals Myself</td>
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<td>Friend or Family</td>
<td>19</td>
<td>11%</td>
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<td>A Carer</td>
<td>21</td>
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<td>No Hot Meals</td>
<td>3</td>
<td>2%</td>
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<td>SIMD Quintile</td>
<td>Least Deprived</td>
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<td>13%</td>
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<td>Most Deprived</td>
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169 total surveys
17 interviews
Nationally Avg BMI- 28 (6.24 SD)*
4.7% Under weight
8.9% Severely Obese
Findings: Relationship of Malnutrition Risk to Psycho-Social Wellbeing

Risks for Lower **Wellbeing** related to:

- Greater **Loneliness** reported (p<0.001)
- Less reported **Social Support** (both variables p<0.001)
- Higher levels of **Food Insecurity & Malnutrition Risk** (both moderately strong, & negative in direction p<0.05)

**Malnutrition Risk** was related to:

- Greater **Food Insecurity**
- Greater **Loneliness**,
- Less reported **Social Support** (both measures),
- More **external locus of control** (all p<0.05)
1) If food was still perceived to be enjoyable - namely being shared and prepared with/for others (isolation and loss) it was different when my husband was alive, I liked if he said, "Well I've enjoyed that" ... you know, if you cooked something but now it doesn't matter (Agatha, 75)

this spiral of, "Ach ah can't be bothered eatin' it's just fer me", and "there'll be nobody comin' round", so I don't need to cook for anyone else (Francis, 79)

2) Financial barriers to food access (food insecurity) not prominent in this research. Structural and societal barriers far more prominent (mobility, transport, local shopping, social networks and living alone)

Now where I live, um, we've had both a butcher and a fish shop close (John, 71)

people have been very good, but uh, it can be a thing, and aye and anxiety sometimes you know uh, I've not got the energy to go across the town and get some messages [food shopping] (Lex, 78)
Dissemination & Knowledge Exchange Tips

• Tell The Story of the Data: Importance of 3rd sector support (in Pandemic)

• Redefining concepts - food insecurity/ malnutrition risk

• Increasing support - for well-being & social connectedness

• Participant Validation - e.g. afternoon tea, sharing findings & hearing reactions

• Get the word out - Impact events, Media, Social Media, Parliamentary events, multi-stakeholder conferences (e.g. IAA Funding)

• Video for onward (Parliamentary) events

• Policy papers*

• Webinars**
Data Lessons?

• Consider Novel/ Innovative Data (e.g. Social Media, Creative Methods)
• Blur Qual/ Quant Boundaries
• Close the Loop- from # & Lived Experiences to **Holistic Stories**
  • Triangulation
  • Interdisciplinarity &
  • DIVERSE Impact/ KE
• Note- Privacy tensions with open data (GDPR)
• Need citizens to WANT to engage, feel heard, be included in decisions
• Need evidence to inform policy, but needs to ‘speak’ to diverse stakeholder needs
Can your research change the world?

Impact Motivations?
• Social Justice?
• Policy Change?
• Including hard to reach populations?
• Is it being debated in policy?
• Is it topical in the press?
• Are there organisations who might benefit from your work?
• How can you reach out/connect?

Policy-Maker Needs?
• Lacking in present evidence base- numbers? experiences?
• How has the issue progressed-in in discussions? In law?
• What are the most recent changes being considered?
• Have you contacted SPICE team? MPs? MSPs?
• What types of events might appeal to political and non-stakeholders?
• Executive summaries, policy briefs & briefing papers vs. Research summaries & articles?
• Tell the story with data

Dissemination for Public?
• What are competing discourses & do they need challenged?
• What are main outlets for this topic? Twitter? News print?
• Can you reach out to contacts, journalists, organisations prolific on the topic?
• User-friendly language?
• Simple story (3 key messages)
• Get media savvy/ training
• Get social media savvy
• Question 1. What would make an impactful policy brief for your research? What would that look like?
• What would the goal of this document be?
• Where would you disseminate it?
• What images might accompany it?
• How would you know it was effective?

Question 2. What would constitute impactful social media coverage of your research?
• What form would this output take? Content and target audience?
• Where would you disseminate it?
• How would you know it was effective?
Visualisations are powerful

- Visualisations key to communicating:
  - Pie charts?
  - Bar Graphs?
  - Scatterplots?
  - Violin plots
  - 3-D models
  - ‘Heat maps’
  - Social Networks…

*Undertheraedar.com*
*Gonnaemapit.com*
Other UBDC UK Data

• Strava cycling app
• Mobile
• Lidar
• Satellite
• Transport

• More UK Education....

• ScotXed Pupil Data
• Higher Education (HESA)
• Further Education (SFC)
• Universities Colleges (UCAS)
• Skills Development/ Employment (SDS)
Working with UBDC?

• Glasgow as comparison?
• Use our DATA or measures?
• Access training or expertise...

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