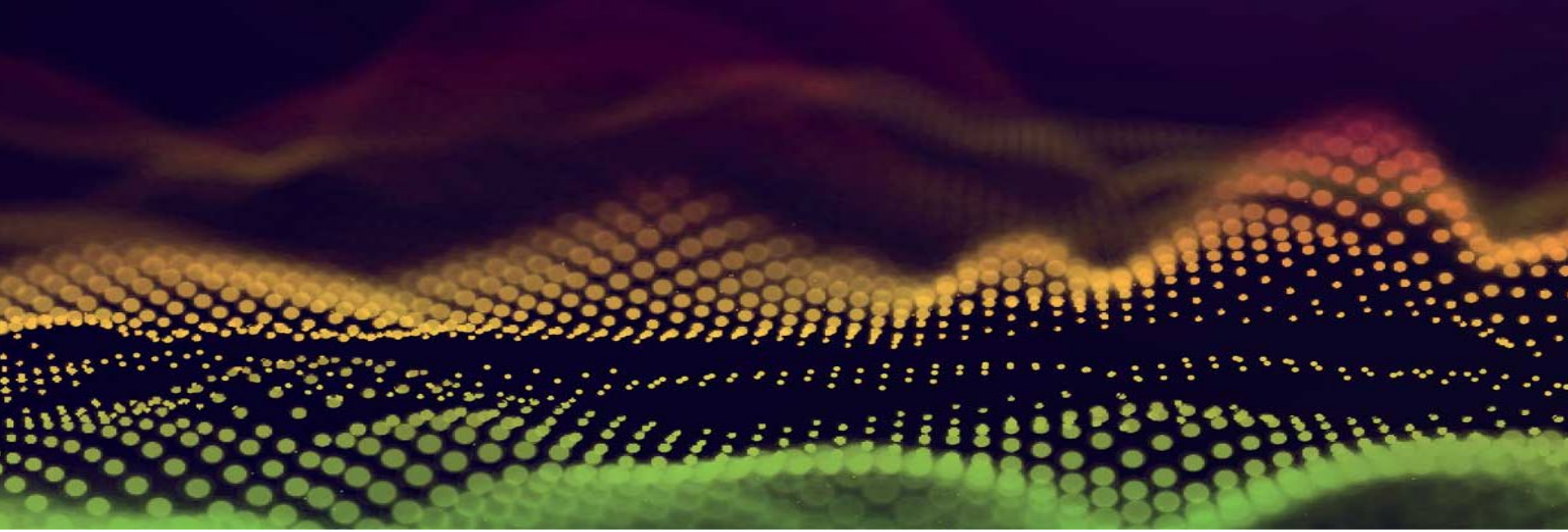


Exploring learning city inclusion with diverse education data

Prof Catherine Lido &
Rachel Cassar (RA)

Urban Big Data Centre

JOINTLY FUNDED BY

UKRI Economic and Social Research Council

University of Glasgow

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**

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

Urban Big Data Centre

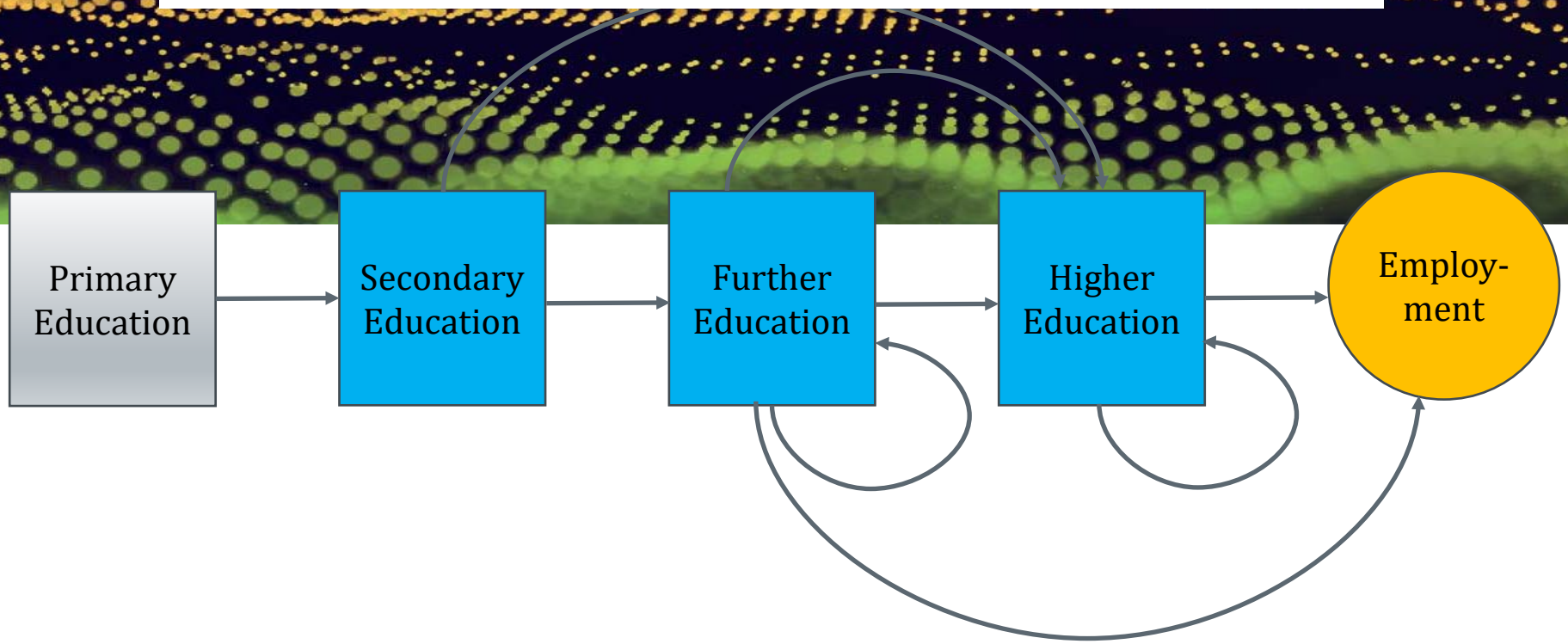
Educational Disadvantage & Place Team

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



Urban Big Data Centre

JOINTLY FUNDED BY

UKRI Economic and Social Research Council

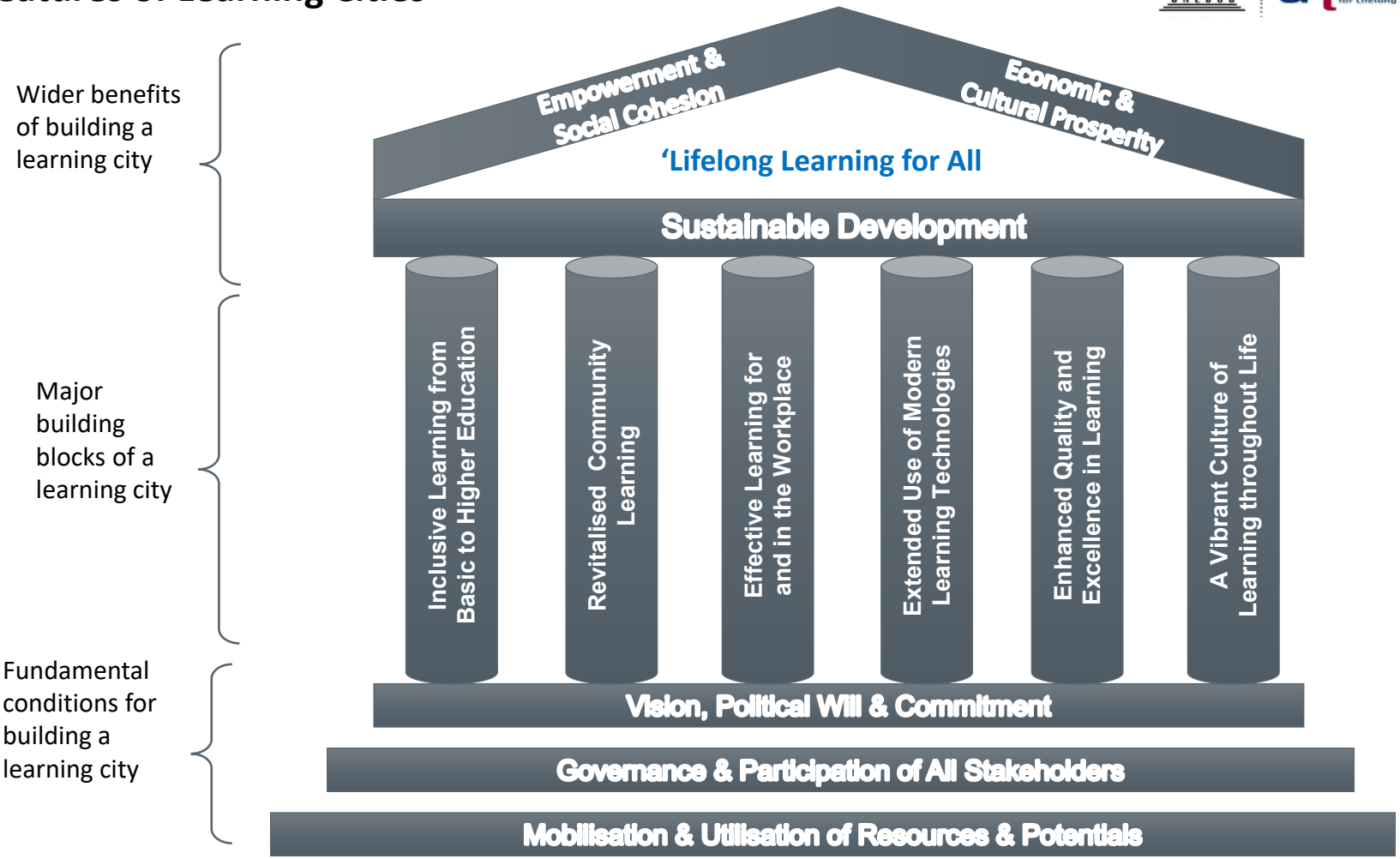
University of Glasgow

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



Ex. Learning City Indicators

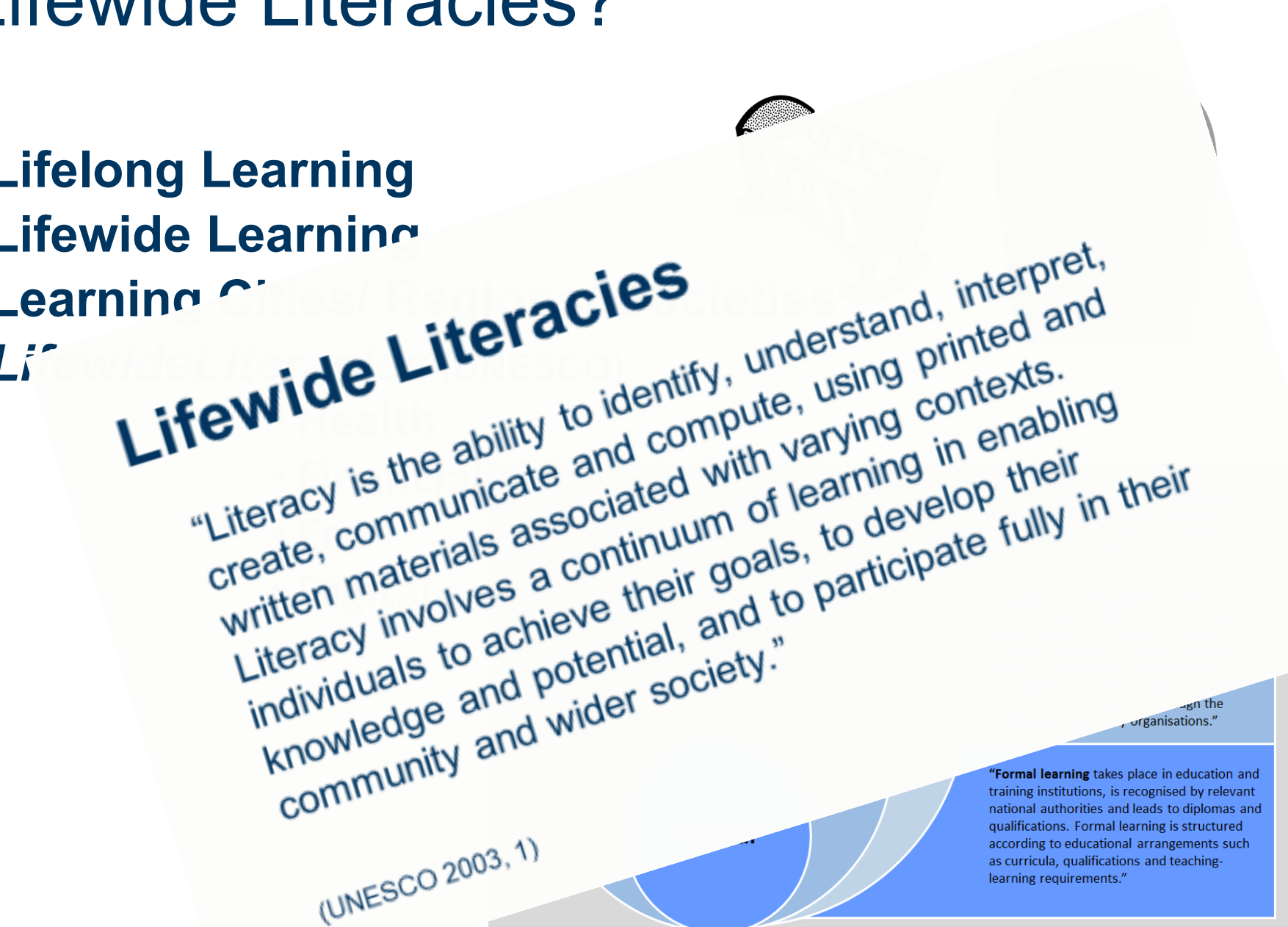
1.1. **Empowering** individuals & promoting **social cohesion** (civic participation)

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/ Regions/ Societies**
- ***Lifewide/Lifelong (UNESCO)***

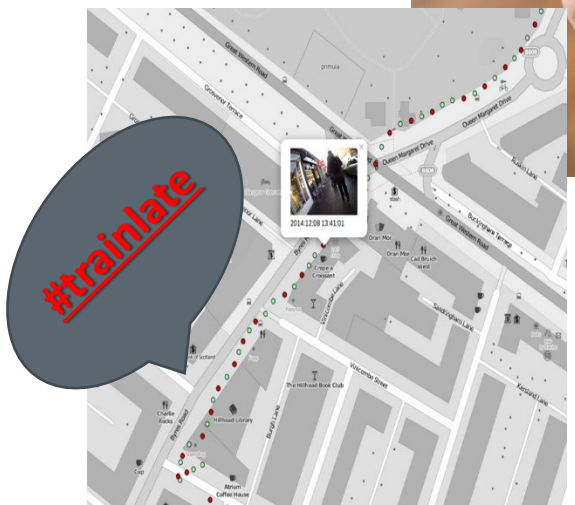


Transforming Learning Cities: Integrated Multimedia City Data (iMCD) Project @UBDC

Urban Big Data Centre

- 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

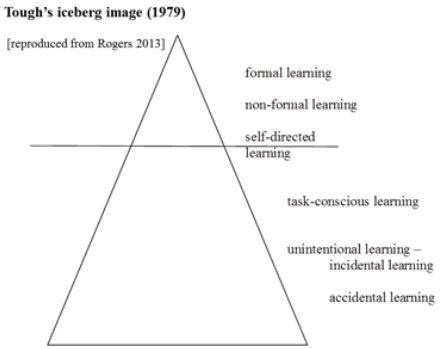
- **Attitudes, literacies & Behaviours**
  - ✓ Education/ skills
  - ✓ Sustainability
  - ✓ Transport
  - ✓ Cultural/ civic
  - ✓ ICT/ technology

- *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

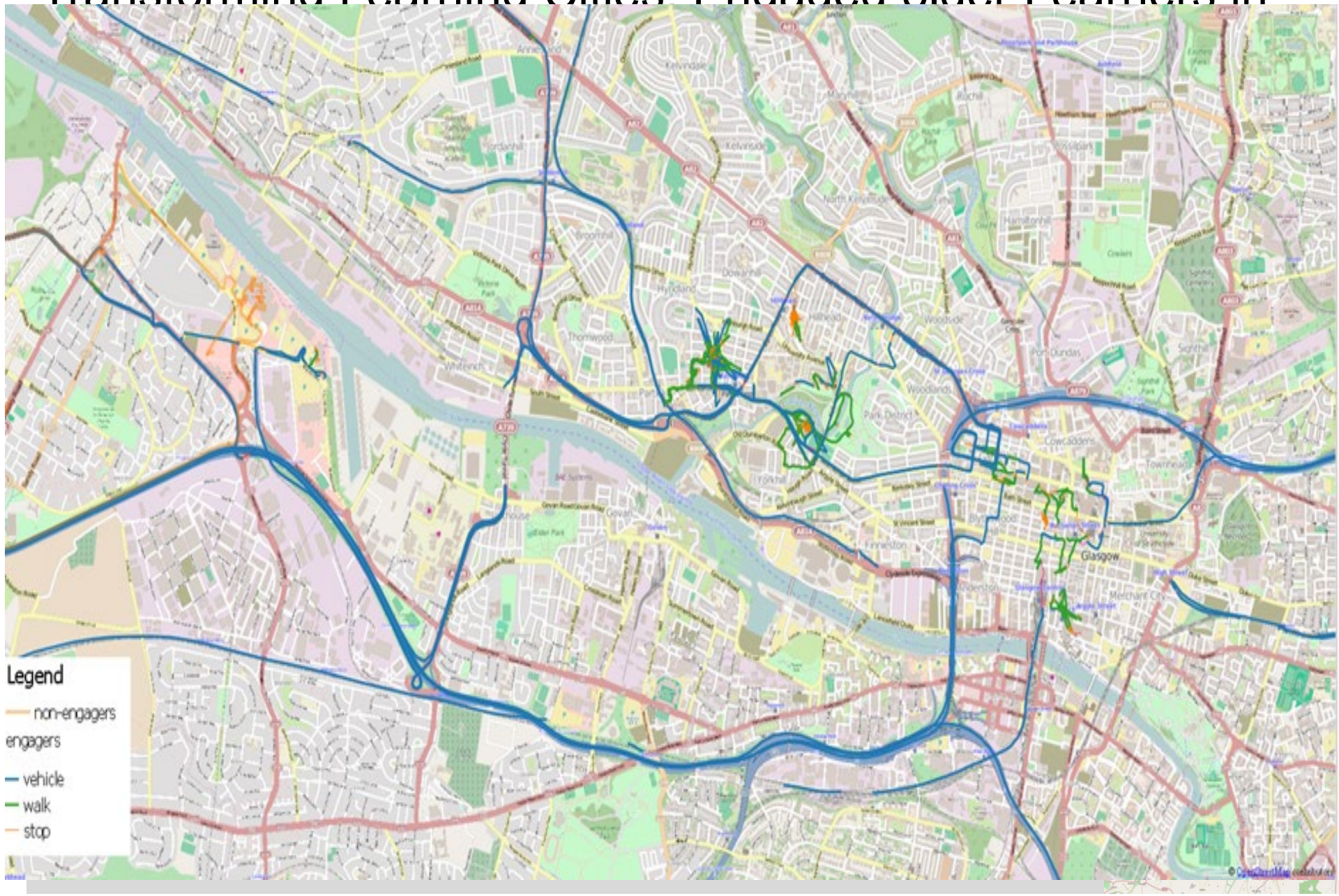


Education Measures Reviewed

•Existing survey measures incorporated include:

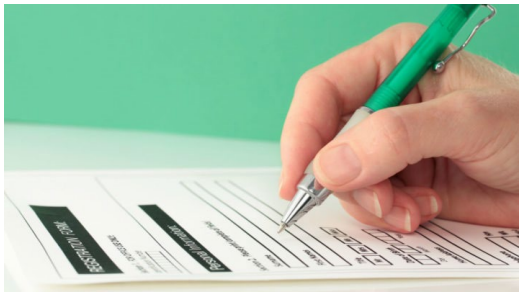
- AES= Adult Education Survey (English Version)
- ALLS= Adult Lifelong Learning Survey
- BHS= British Panel Household Survey
- Britsocat= British Social Attitudes Survey
- CFLS= Consumer Financial Literacy Survey
- NALS= National Adult Learning Survey
- NIACE= National Institute for Adult Continuing 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



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 healtl *(Beauchamp et al., 2015)*
- A critical empowerment strategy

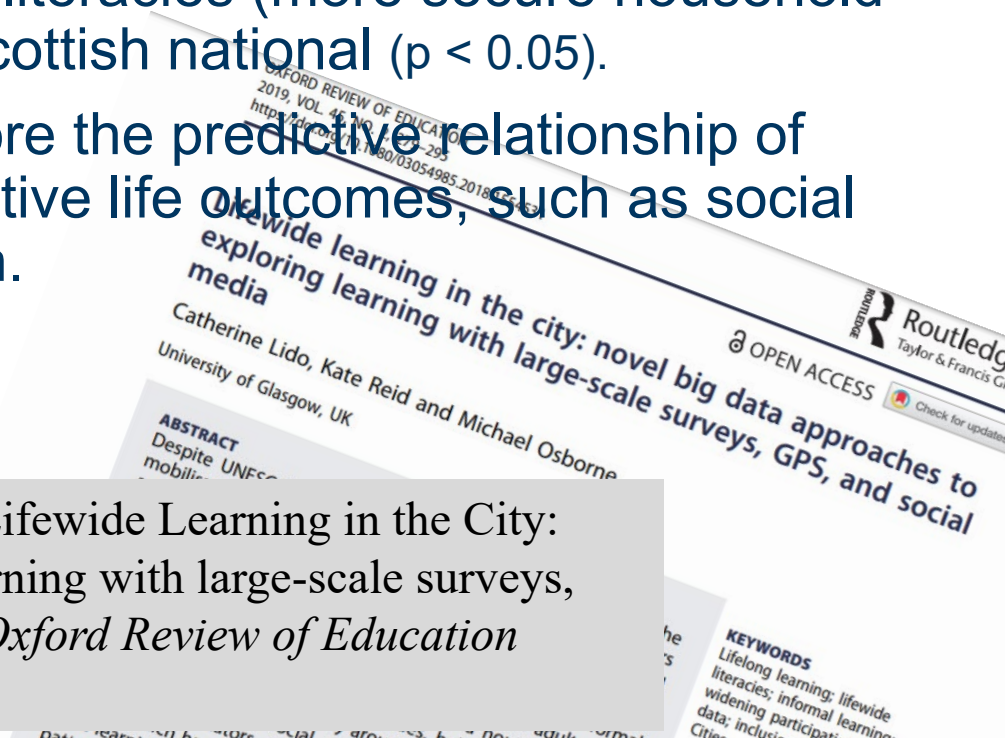
2 iMCD items- validated for single item use

- *'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.



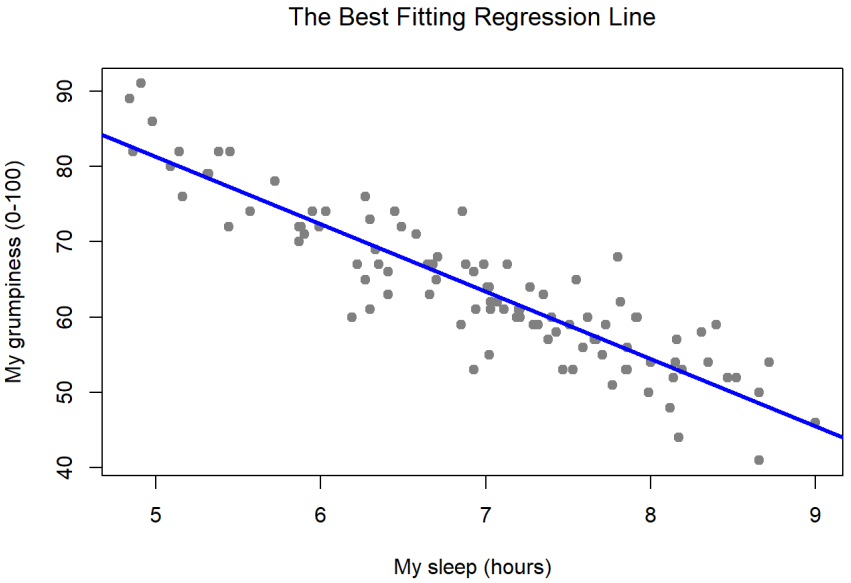
Lido, C., Reid, K. & Osborne, M. (2019). Lifewide Learning in the City: Novel big data approaches to exploring learning with large-scale surveys, GPS, Lifelogging images & social media. *Oxford Review of Education* 45(2), 279-295.

Linear Regression

- Type of General Linear Modelling
- In Classical or Frequentist stats
- Where outcome to be predicted is normally distributed(ish); predictor any d[illegible]
- And relationship between varia
- Y = a + bx (or = c + mx)

Outcome = intercept + slope by p

- Simple- 1predictor IV, 1 outcom
- Multiple- 2+ predictors, 1 outcc
- % variance (SS) explained for by much error?
- Look out for- outliers, multi-col 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

Predictor	β
Eco Literacy	.11***
Financial Literacy	.20***
Health Literacy[1]	.35***

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

- **Social Engagement** matters-

Adj.R^2= 16.1% ($p<.001$)[3]

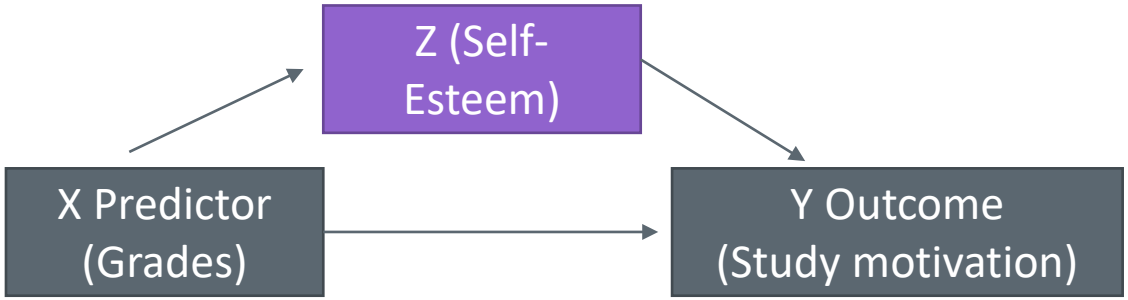
Predictor	β
Area Rating	.18***
Area Belonging	.21***
Safe Walking at Night	.08**
Plans to Move[2]	-.06*

Moderated/ Mediated Regressions

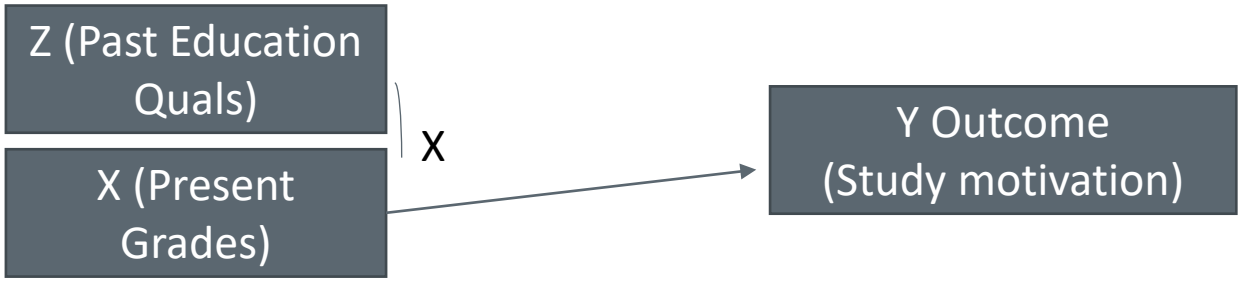
- How presence of a third variable (Z) affects existing relationship between 2 other variables (X&Y)

(e.g. indirect effect of confound or covariate)

- Mediator in middle (Grades-Self-Esteem-Motivation*)

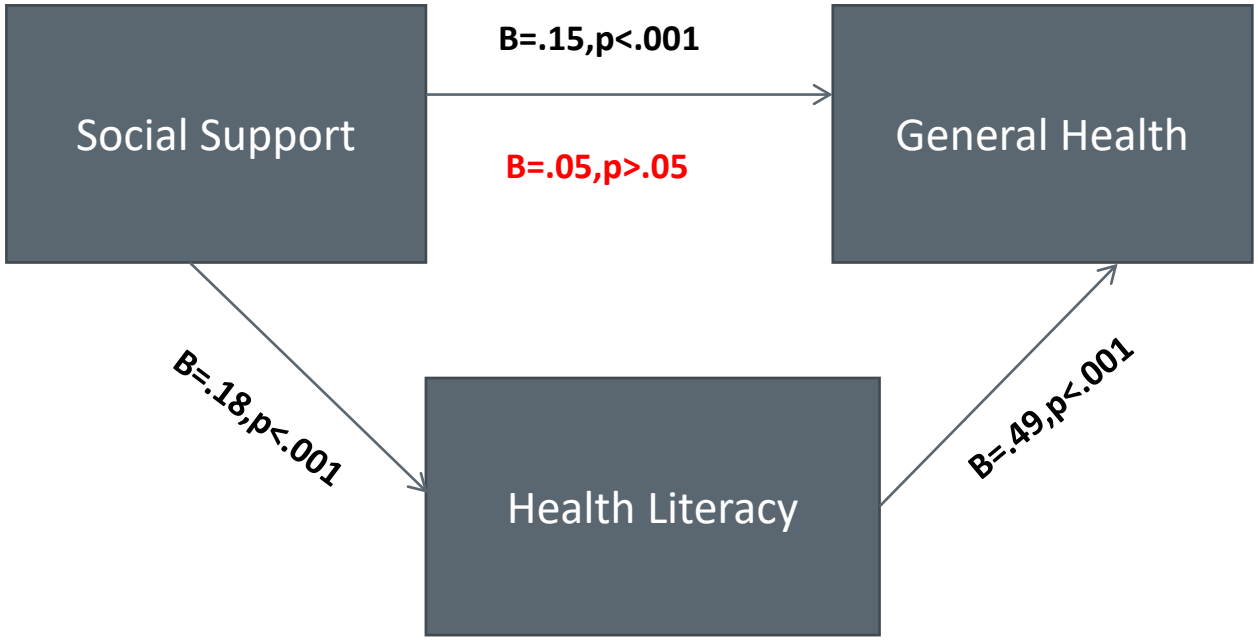


- Moderator at start, like foot on accelerator



Urban Big Data Centre

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

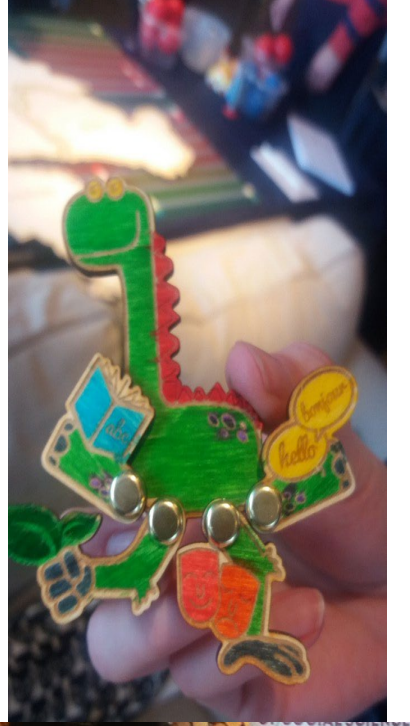
- Migration
- Disability & transport
- Housing
- Politics

-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-

Urban Big Data Centre



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


University of Glasgow
Can @UrbanBigData help you with your education research?
• Data- iMCD, FE, HE?
• Skills training?
• Future funding collaborations?
INSPIRING PEOPLE
www.ubdc.ac.uk
@UrbanBigData
LinkedIn urbanbigdata