Data Education for All

Bringing the benefits of the City Region Deal to local learners

Professor Judy Robertson, Moray House School of Education
DDI Skills Gateway: Our Approach to Inclusive Growth

Opportunity for all at School and FE

Gender equality across all stages

Those at risk of ‘automation’

Across the whole city region

Opportunities for people with disabilities
The proposal

All children in the City Region will have the opportunity to excel in data education, regardless of their gender, location or financial circumstances.

121k Learners across the region over 8 years
Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and J.J. Guyot

from the Harvard Business Review

MODERN DATA SCIENTIST

Data Scientist, the sexiest job of the 21st century, requires a mix of multidisciplinary skills ranging from an intersection of mathematics, statistics, computer science, communication and business. Finding a data scientist is hard. Finding people who understand what a data scientist is, is equally hard. So here is a little cheat sheet on who the modern data scientist really is.

MATH & STATISTICS
- Machine learning
- Statistical modeling
- Experiment design
- Bayesian inference
- Supervised learning: decision trees, random forests, logistic regression
- Unsupervised learning: clustering, dimensionality reduction
- Optimization: gradient descent and variants

PROGRAMMING & DATABASE
- Computer science fundamentals
- Scripting languages: Python, R
- Statistical computing packages: e.g. R
- Databases: SQL, and NoSQL
- Relational algebra
- Parallel databases and parallel query processing
- MapReduce concepts
- Biplot and R/bioconductor
- Custom libraries
- Experience with web-scale AWS

DOMAIN KNOWLEDGE & SOFT SKILLS
- Passionate about the business
- Concerned about data
- Influence without authority
- Ability to market
- Problem solver
- Strategic, proactive, creative, innovative, and collaborative

COMMUNICATION & VISUALIZATION
- Able to engage with senior management
- Story telling skills
- Translate data into insights into documents and audiences
- Visual art design
- Data visualizations for a data scientist role
- Knowledge of any of visualization tools e.g. Tableau, Qlik, D3.js, Tableau

Marketing.com is a group of professionals in the area of customer marketing. The fields of expertise include the design of marketing strategies and analytics; customer experience; customer analytics; and customer data visualization and for data scientists. marketing.01.com insights on customer.01.com, D3.js, data, and travel.
A data literate person:

“understands, explains, and documents the utility and limitations of data by becoming a critical consumer of data, controlling his/her personal data trail, finding meaning in data, and taking action based on data. The data-literate individual can identify, collect, evaluate, analyze, interpret, present, and protect data.” (ODI 2015).
Why UoE?

• Because we are driving data driven innovation across the region, which has the potential to disrupt jobs in the future

• We have a chance to make this a positive disruption – data education can help local people be part of the innovation
Education, more than outreach

• The University already does great work in schools outreach

• With some effort, we can:
  – Make it sustainable (not just one off sessions)
  – Build on learning, year by year
  – Help teachers and learners with curriculum outcomes
  – Make it equitable (for “ordinary” schools)
An example

DATA
Newbattle, Digital Centre of Excellence
Why physical activity matters

Physical activity for children and young people (5–18 Years)

- Builds confidence & social skills
- Develops co-ordination
- Improves concentration & learning
- Strengthens muscles & bones
- Maintains healthy weight
- Improves health & fitness
- Improves sleep
- Makes you feel good

Be physically active

Spread activity throughout the day

Aim for at least 60 minutes everyday

- Play
- Run/Walk
- Bike
- Active travel
- Swim
- Skate
- Include muscle and bone strengthening activities
- Sport
- PE
- Slow
- Climb
- 3 times per week
- Workout
- Dance

Sit less

Move more

Find ways to help all children and young people accumulate at least 60 minutes of physical activity everyday

UK Chief Medical Officers’ Guidelines 2011 Start Active, Stay Active: www.britify/startactive

The Daily Mile
fit for life
What is the best visual representation for this data?

What advice should we give children about how to make positive changes based on data?

Where is this data stored, and who gets access to it?

What kinds of personal health data are children interested in?

Who do children want to share the data with?

What about parents? Or teachers?
Microbit step counter
Dreams for the future
Personally meaningful

I like Mewtwo now, because he’s really strong, fast, and really defensive.

Local data

Look at that, there are fewer bats nesting in the park than there were last year. I wonder why.

Animals in our park

2016 | 2017
---|---
Bat sightings | Hedgehog sightings

Warning: this data is completely made up by me. No furry/spikey creatures were harmed in the manufacture of this data.
Hang on.....This data is showing that people who live in this area are breathing much more polluted air than others. It’s way over the recommended levels.

https://scot.okfn.org/2014/02/19/live-in-fragments-no-longer/
Why do people in North Korea live for a long time but have low income?

https://www.gapminder.org/tools/
Science was great today. I saw a totally new galaxy!

https://www.universetoday.com/13585/galaxy-zoo-gets-a-makeover/
How can we scale this to 528 schools?

– a well-designed and coherent curriculum from nursery upwards
– inspiring and exciting teaching materials
– teachers who are confident and competent in data education;
– productive collaborations between the University staff and students, City Region schools and local employers and charities;
– robust evaluation
– internationally leading research and knowledge-sharing to deepen our understanding of how data impacts society
Questions?

If you know of an interesting data set which kids should learn about, email Kate Farrell digitalkatie@gmail.com, subject line: IT Futures
Delivering impact for society

- Leadership in learning
- Influencing globally
- Leadership in research
- Contributing locally
- Partnerships with industry
- Digital transformation and data
- Our vision and ambitions for growth

The city of Edinburgh and our role in it

Our people