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Set to Lead Report Launch

JOBS FOR THE BOYS? WHERE DO ENGINEERING UNDERGRADUATES GO?

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Set to Lead

supporting female undergraduates into successful STEM careers

SET to Lead team: Jan Peters, Sean McWhinnie Helen Duguid, Karen Dickens and Anthony Finkelstein

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Action research

Anecdote: Women don't perform as well at assessment centres

FACT: In 2006/07, twice the proportion of men graduating with undergraduate qualifications in STEM entered SET professional or associate professional occupations (41.8 per cent) compared with women (21.0 per cent)

Questions

- Evidence the numbers
- Explore assessment centre performance by gender
- Explore graduates experience by survey

Outputs

- short report
- inclusive assessment centres – good practice guide
- Resources and insights

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HEI survey and roundtable - current leadership best practice

Industry roundtable - leadership needs, desires & training - brainstorm of leadership skills activities

Modules to be used to support course materials

On-site industry open days for women students – video students and leaders

Seminar development based on how to use videos and introduce leadership styles

Underpinning research on the undergraduate experience, initial employment destinations and success at assessment centres

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- The retention of female SET graduates is much lower than their male counterparts which constrains the pipeline.
- Increasing the diversity of the SET workforce through the recruitment and retention of women and promoting technically qualified women into executive roles requires a focus on the early part of the career pipeline and on developing leadership skills.

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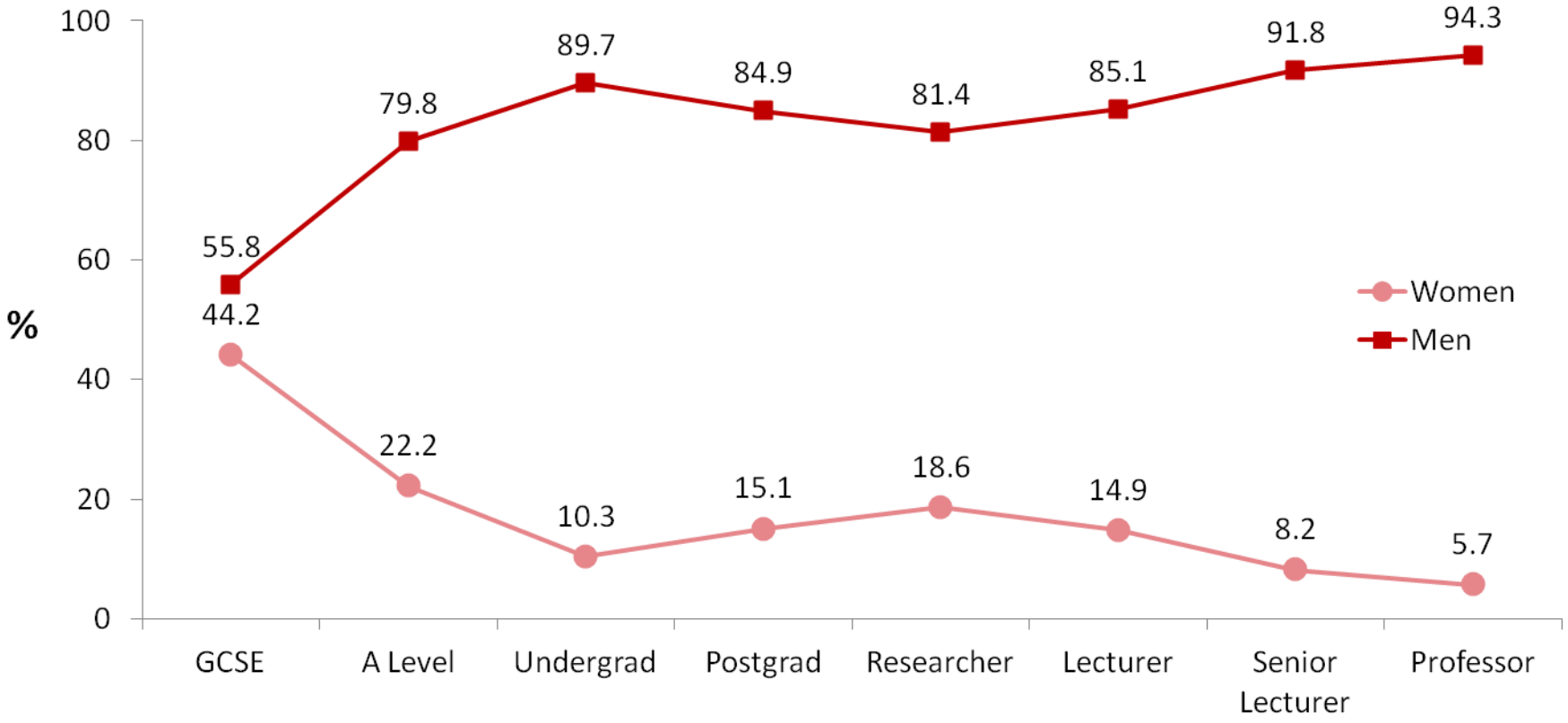
Academic progression in Mechanical, Aero & Production Engineering by gender, 2007/08



Data source: HESA (2008)

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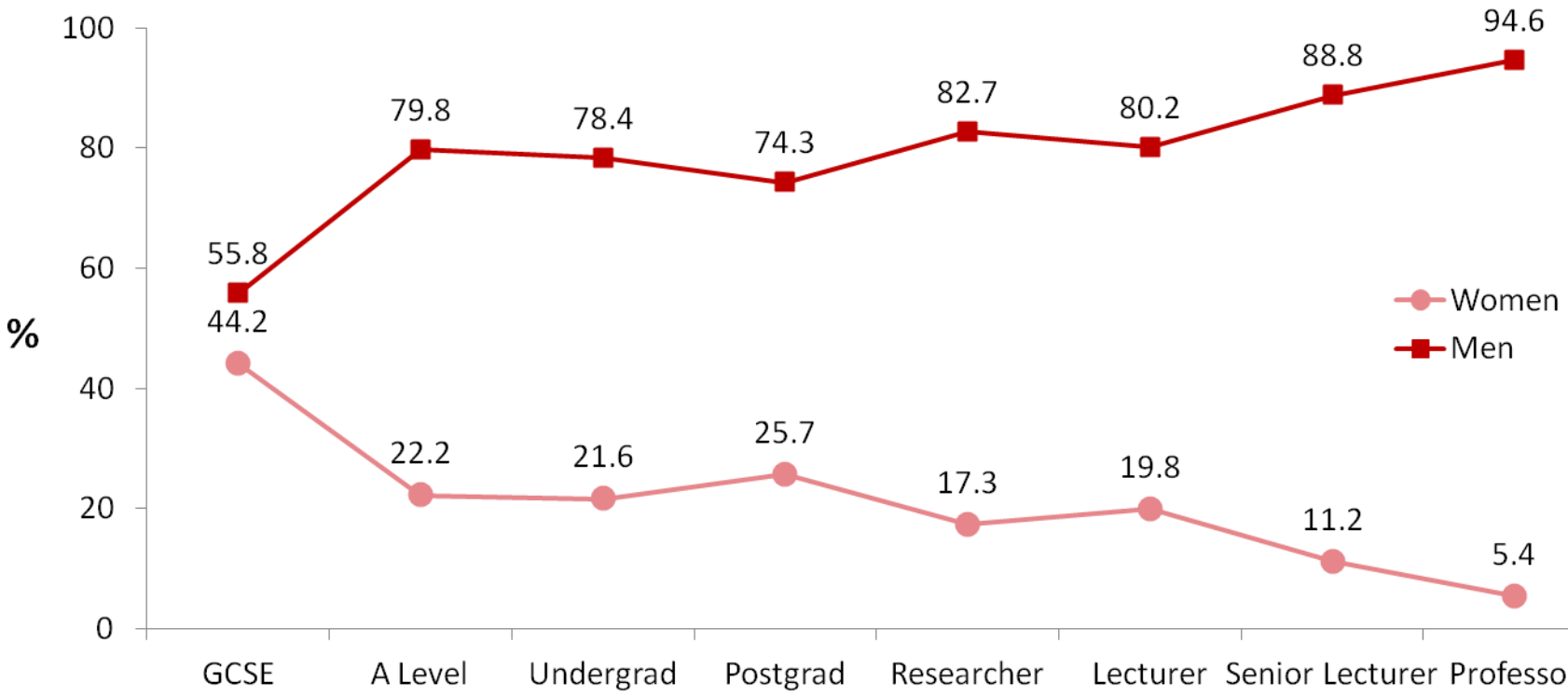
Academic progression in physics by gender, 2007/08



Data source: HESA (2008)

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Course destinations of accepted applicants with physics A-level in 2011

Males		Females	
Course destination	**%**	**Course destination**	**%**
Mechanical Engineering	10.9	Mathematics	10.5
Physics	10.3	Physics	7.5
Mathematics	8.5	Pre-clinical Medicine	5.7
Civil Engineering	5.8	Chemistry	4.5
Electronic and Electrical Engineering	4.8	Civil Engineering	3.8
Computer Science	4.7	Mechanical Engineering	3.4
Aerospace Engineering	4.2	Combs of 3 subjects, or other gen courses	3.3
Chemistry	3.6	Architecture	3.3
General Engineering	3.4	Others in Subjects allied to Medicine	2.5
Pre-clinical Medicine	3.0	Chemical, Process and Energy Engineering	2.4

Data source: UCAS/IOP

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Research elements

- Secondary analysis of HESA data, including DLHE data
- On-line survey investigating the variation of undergraduates' career intentions through the course of study.
  - 4,624 cleaned responses
  - 1,200 from women

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Full time students completing first degree courses in 2009/10

Subject	Total Students	Female
Aeronautical Engineering	1425	10.5%
Chemical Engineering	1175	27.0%
Civil Engineering	3575	16.3%
Electronic Engineering	4650	13.7%
General Engineering	1410	20.4%
Mechanical Engineering	4350	8.8%
Production Engineering	1190	23.6%
Computing Science	3015	28.6%

Data source: UCAS

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Most likely intended initial destinations of survey respondents in the final year of engineering courses

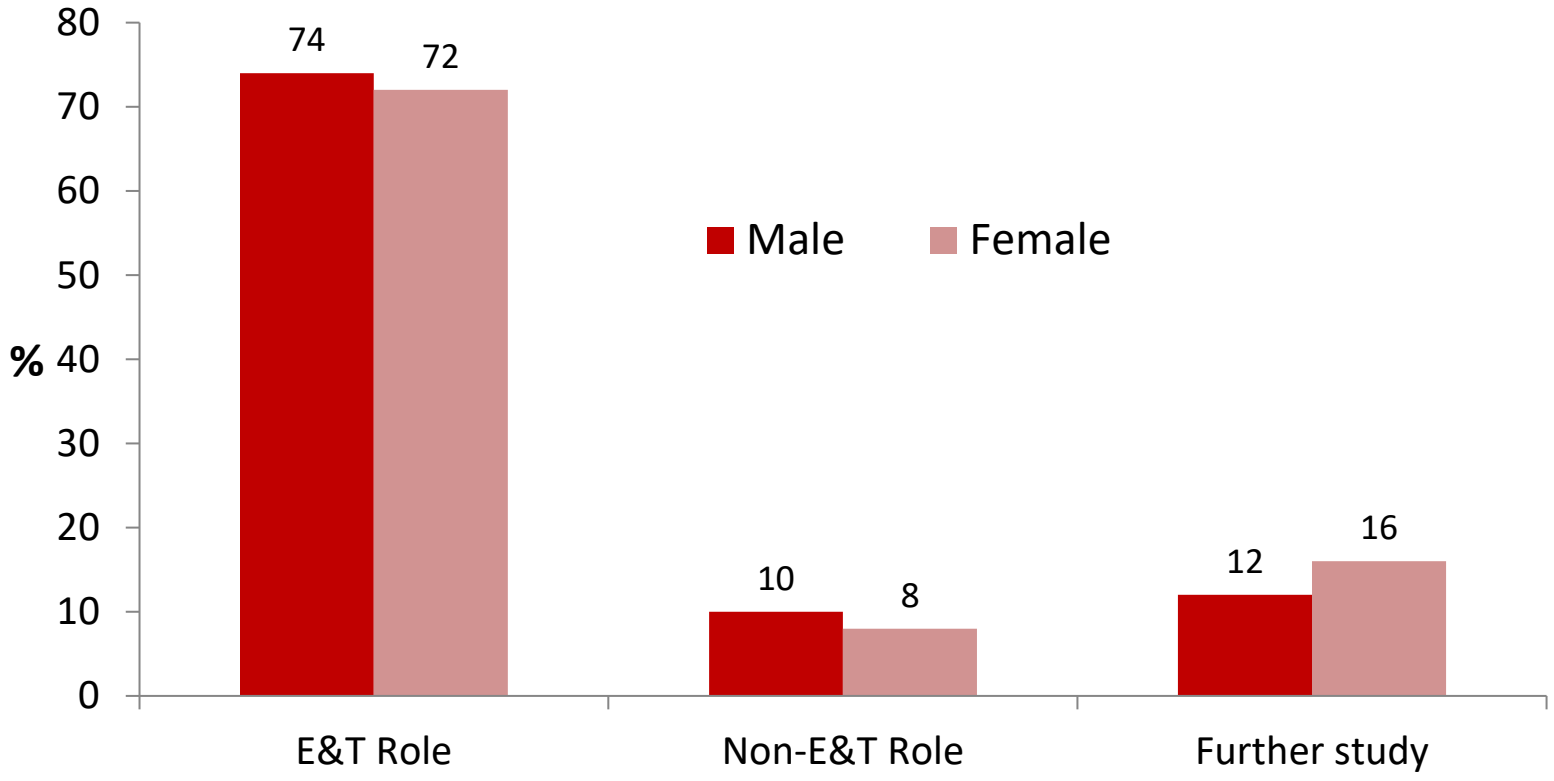

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Table 65: The most popular companies for which respondents expressed an interest in working

Top 10 companies: all respondents

Rank	Male (N=2669)		Female (N=734)	
1	Rolls Royce	15.0%	Arup	9.5%
2	BAE Systems	9.9%	Google	7.5%
3	Google	8.8%	Microsoft	7.5%
4	Microsoft	8.1%	Rolls Royce	7.2%
5	BP	6.7%	Atkins	5.6%
6	Jaguar Land Rover	6.1%	BP	5.2%
7	Apple	5.8%	Apple	4.5%
8	Arup	5.5%	Balfour Beatty	4.2%
9	IBM	5.1%	IBM	4.2%
10	Airbus	4.4%	Airbus	4.1%

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Top 10 companies: mechanical engineering

Rank	Male (N=521)		Female (N=74)	
1	Rolls Royce	31.5%	Rolls Royce	20.3%
2	Jaguar Land Rover	16.9%	BP	10.8%
3	BAE System	16.5%	Jaguar Land Rover	10.8%
4	McLaren	12.3%	McLaren	10.8%
5	BP	9.0%	Shell	10.8%
6	Aston Martin	6.7%	Airbus	8.1%
7	Shell	6.5%	BAE Systems	8.1%
8	Airbus	6.3%	ARUP	4.1%
9	BMW	3.8%	Caterpillar	4.1%
10	Audi	2.7%	EDF Energy	4.1%

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Top 10 companies: computer science

Rank	Male (N=509)		Female (N=155)	
1	Google	35.2%	Microsoft	32.9%
2	Microsoft	34.4%	Google	30.3%
3	IBM	16.9%	IBM	14.8%
4	Apple	12.4%	Apple	12.9%
5	Cisco Systems	6.3%	Liberty IT	7.1%
6	Intel	5.9%	GCHQ/Military Intelligence	7.1%
7	GCHQ/Military Intelligence	4.7%	BT	6.5%
8	Facebook	4.1%	Kainos	6.5%
9	British Telecom	3.1%	CITI	5.2%
10	Blizzard	2.9%	Intel	5.2%

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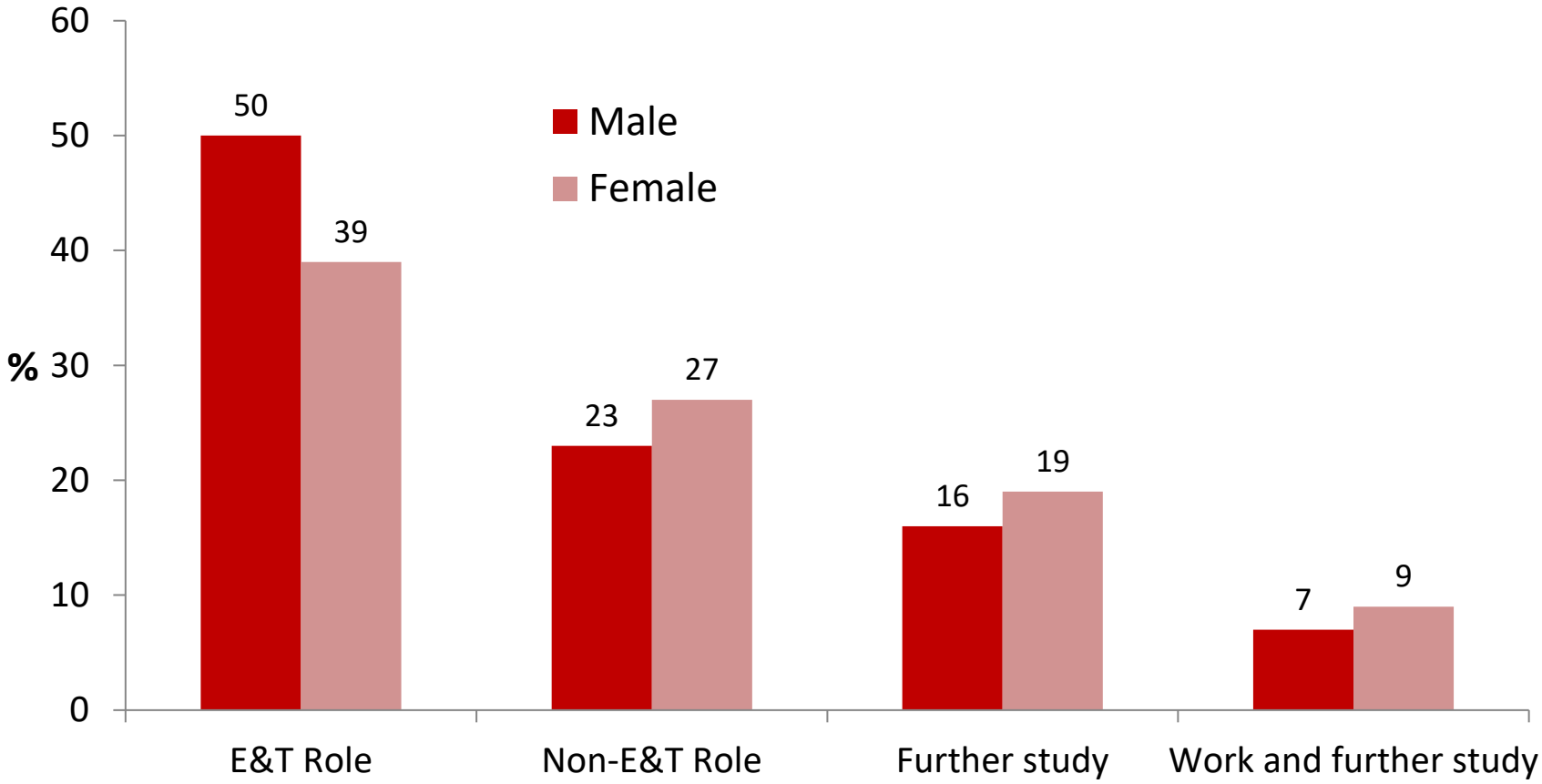
Main activities of graduates in engineering subjects in 2008/09 and 2009/10



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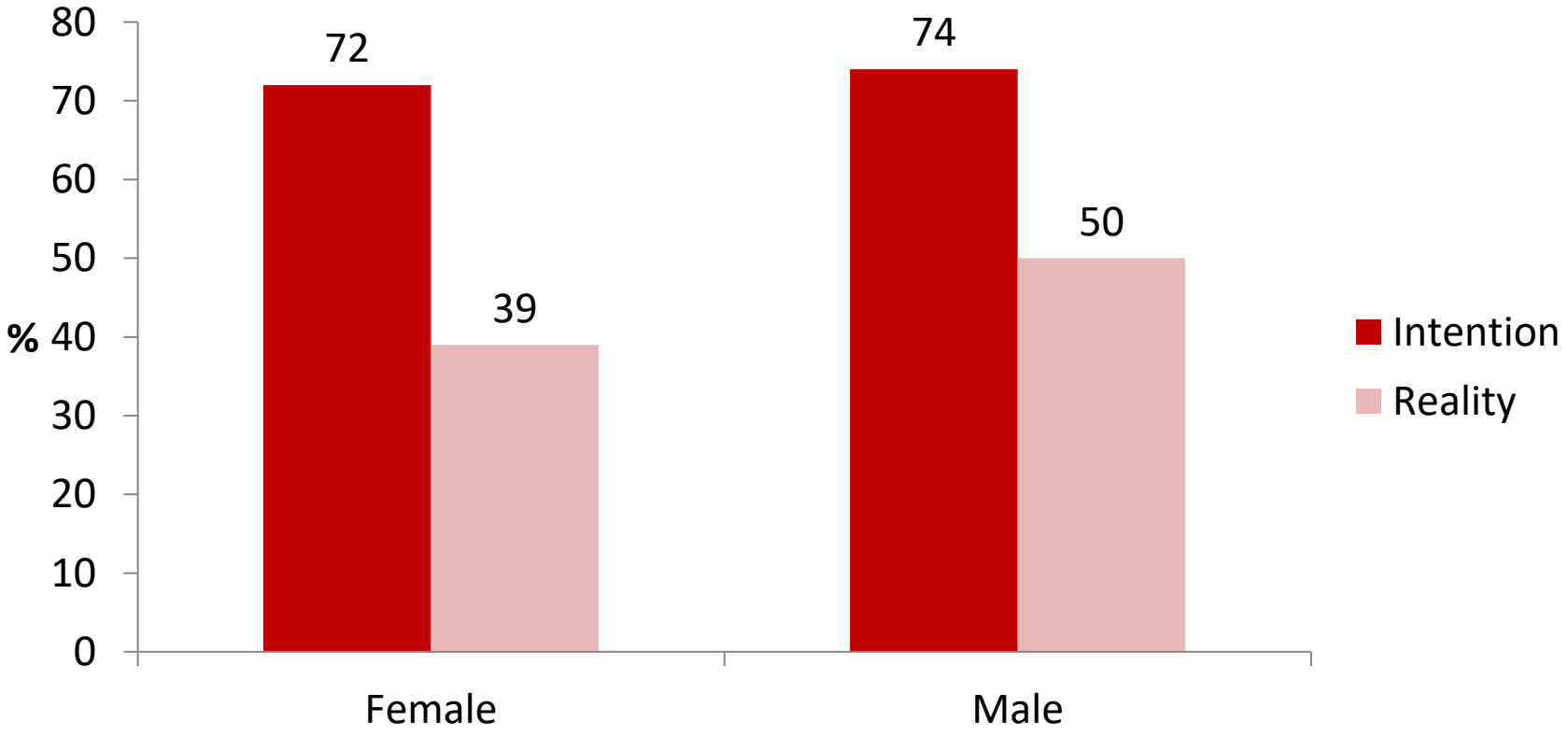
Comparison of proportion of engineering survey respondents who intend to work in E&T roles with graduates who work in E&T roles



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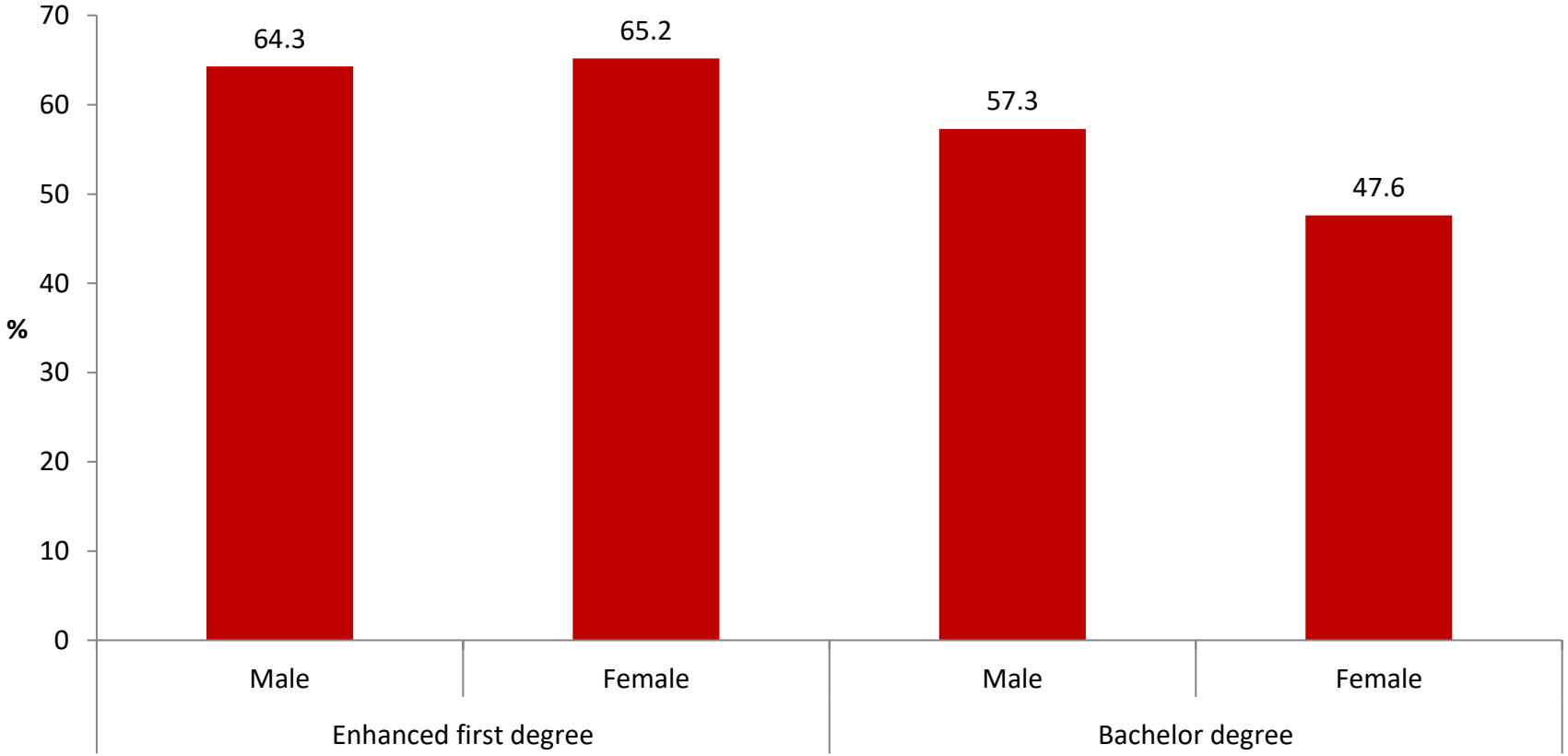
UK domiciled graduates from engineering subjects in full time or part time work 2008/09 and 2009/10



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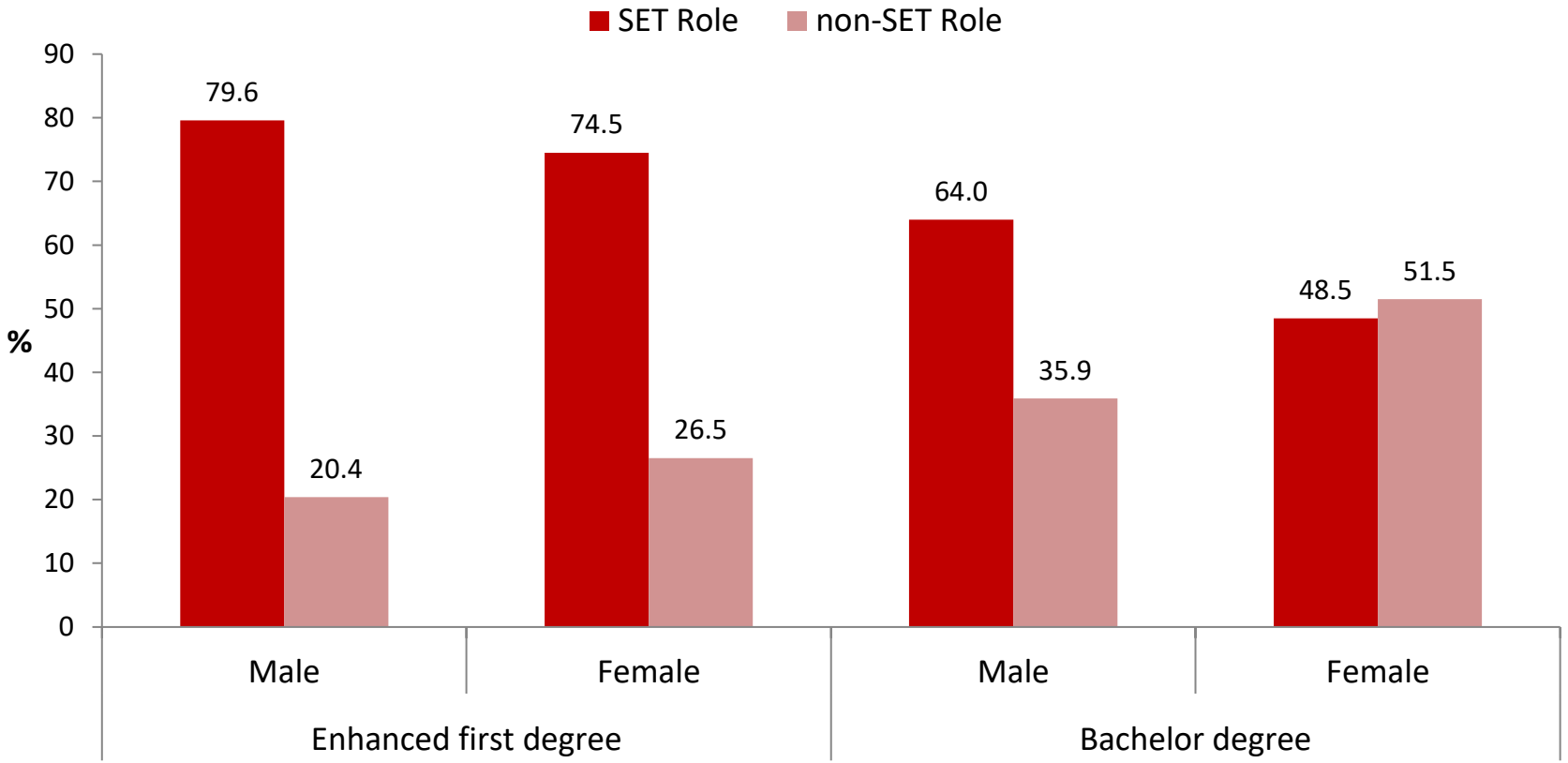
The STEM occupations of UK domiciled graduates from engineering subjects in full time or part time work 2008/09 and 2009/10



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- In general women are less likely to enter SET roles even though both men and women are equally likely to state that they wish to
- This appears to be related to the lower “career confidence” of women E&T students

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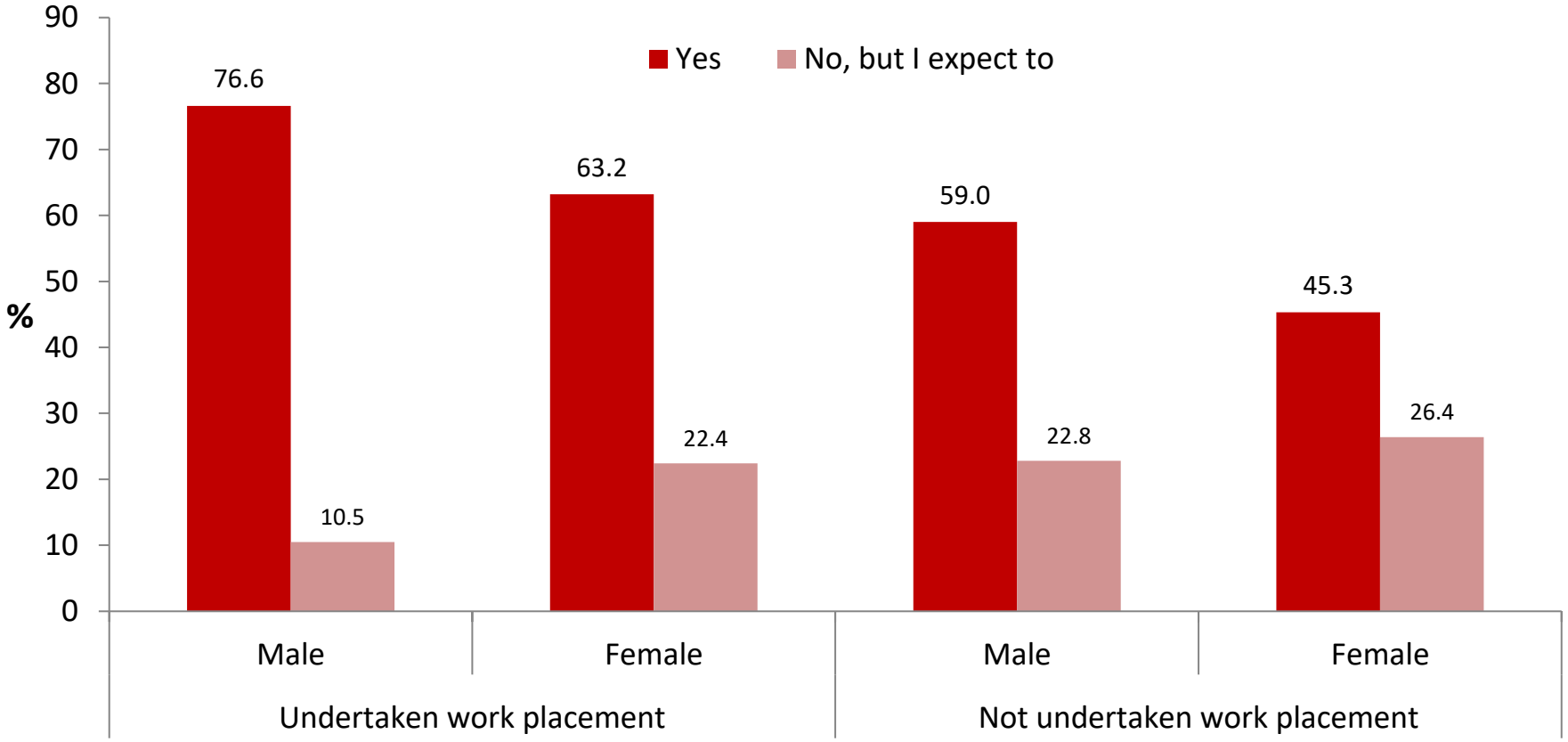
Do final year students believe they possess the technical skills that employers want?



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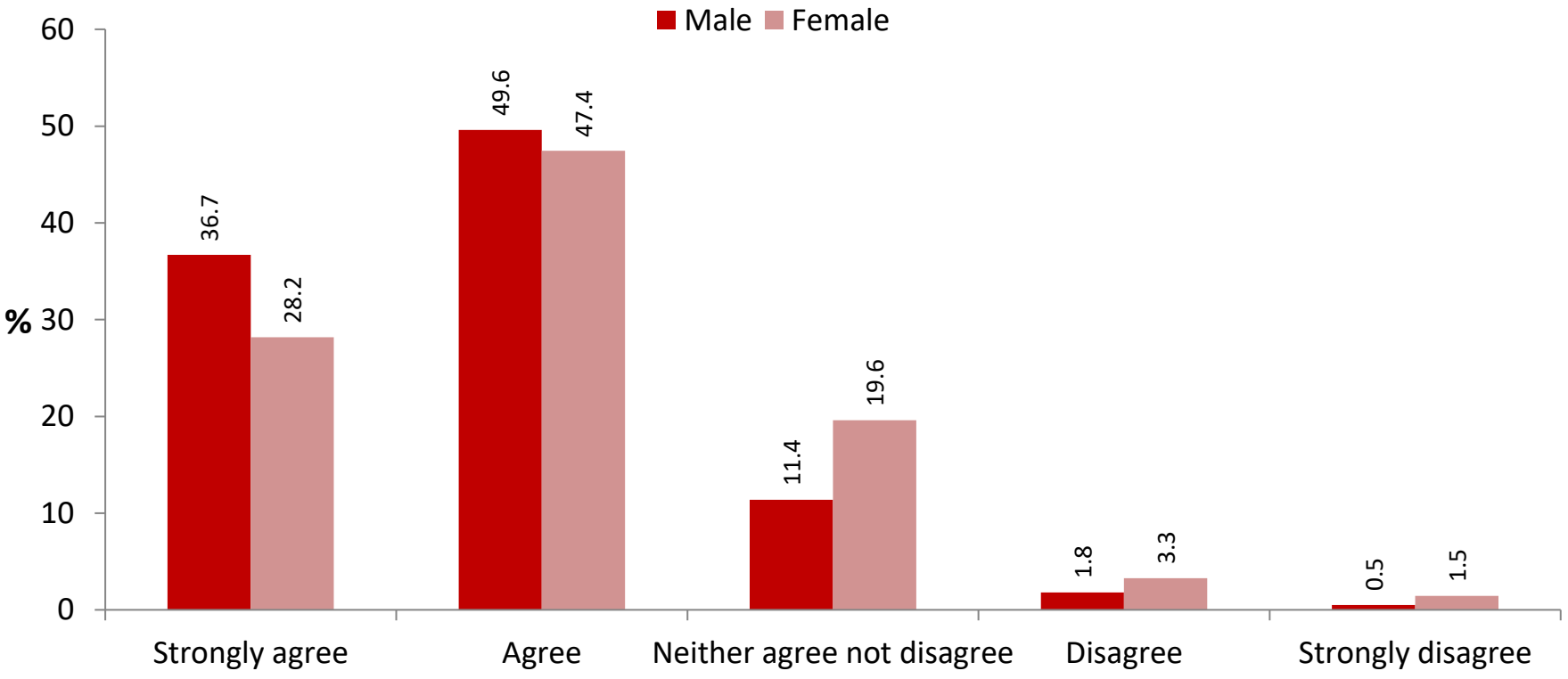
I feel confident that I will make a good engineer/ technologist



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- Key actions are around building the confidence of women engineering and technology students

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Defining and developing the outputs to support women: foundations for inclusion

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Why are we losing women?

Better offer from elsewhere

Further qualification

?

Engineering Employment

Put off engineering during course

Put off during recruitment

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What we explored as ‘fixes’

- Behaviours of students
- Course content on teaming and leadership
- Where students want to go and where they go
- Support resources to help facilitate learning for employability skills so students get the jobs that are right for them

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Academics' views

Lack of visible female senior women role models

Roles women play in teams

Male student behaviours

Lower confidence of women

Possible
marginalisation of women students
through unconscious bias

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Employers' views

Lower confidence of female students in general

Not applying

High expectations of male students (by staff and themselves)

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What we could tackle

- How to establish an appreciation of others' strengths
- Challenging problems with no clear right or wrong answer
- Scenario based activities that were based on real life situations
- Role models from science and engineering
- To hear stories from leaders about when things went wrong or they were challenged
- To be able to introduce leadership and team skills in a way that did not require an in depth knowledge

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Leaders supporting scenarios

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Workshops and events

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Knowing yourself and your strengths and weaknesses

STRATEGIC THINKING

Listening and observing

Business imperatives and the wider world

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Links to reports and further information

www.katalytik.co.uk