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Entering STEM in later life: examining the motivations of adult women studying computing

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Entering STEM in later life: examining the motivations of adult women studying computing

Clem Herman, Helen Donelan, Helen Jefferis & Janet Hughes
The Open University, UK

4th Network Gender and STEM Conference
University of Oregon, Eugene
30 Jul to 2 Aug, 2018



The Open
University

Research on women's underrepresentation in computing

Most research focuses on choices made by girls/ young women at school or college/ university (Cohoon and Asprey 2006).

Social and cultural factors such as stereotype threat where women and girls perform less well because they are unconsciously conforming to stereotyped expectations (Deemer et al, 2014).

Girls motivated by the social function and context of learning. Self to prototype similarity influences learning to code. (Neuhaus and Borowski, 2018)

Gender differences in field of study can be attributed to both socialisation AND rational choice factors (Gabay-Egozi, Shavit, & Yaish 2015)

BUT very little on mature women – either returning to IT or changing career - importance of taking a life course perspective (Herman & Webster 2010, Castaño & Webster 2011).

Women often come into IT through unconventional routes (Herman and Ellen 2004)

Cross cultural studies indicate country/cultural differences, eg India has equal gender representation entering careers in IT (Sondhi, Raghuram and Herman 2018)

Women and IT in the UK

THE WOMEN IN IT SCORECARD

*A definitive up-to-date
evidence base of data and
commentary on women in
IT employment and
education*



2016

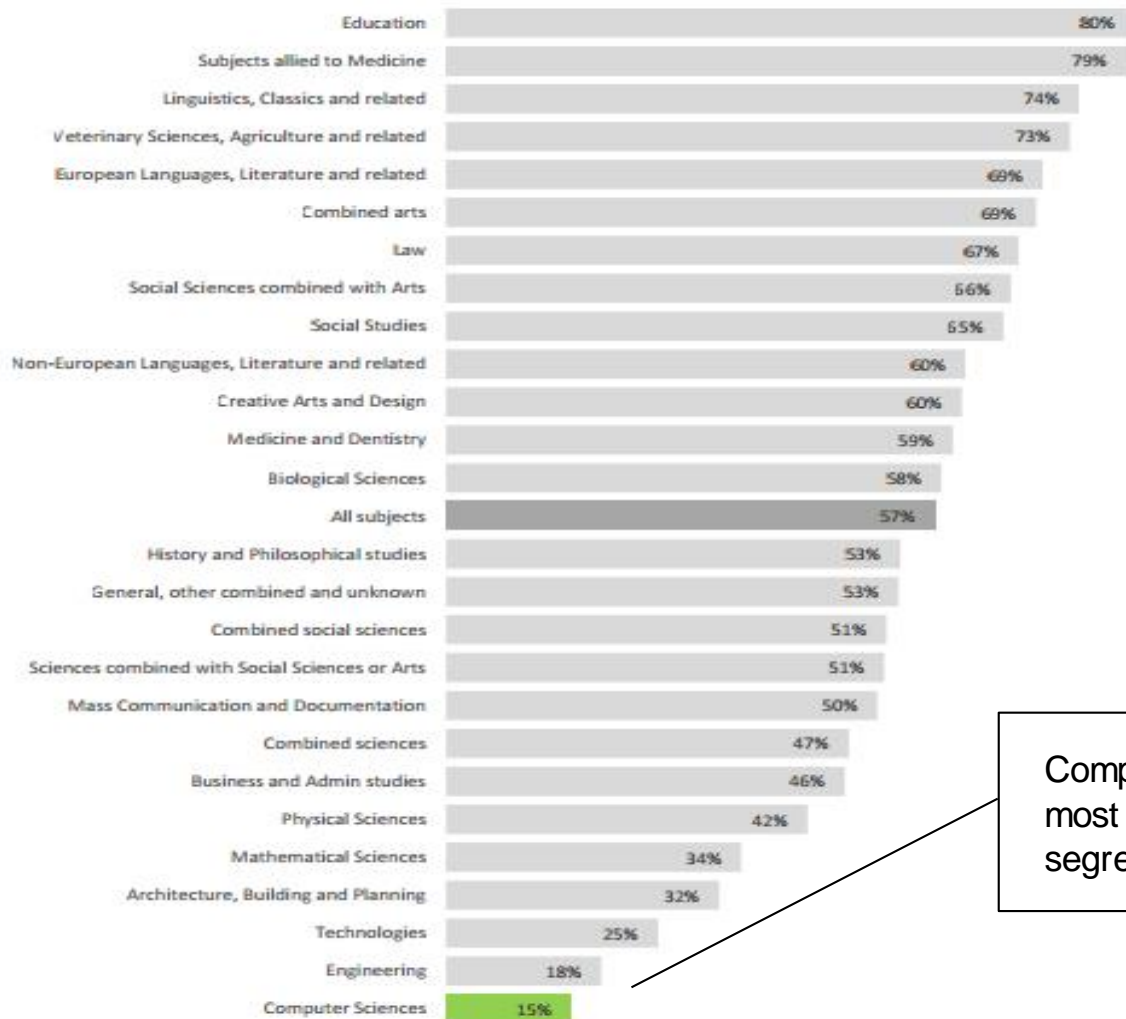
Proportion of female applicants to specific Computer Science sub-disciplines (for courses with 100 or more female applicants) :

Information Systems - 18%, 'other' Computer Science courses - 17%, 'straight' Computer Science - 14%, combinations in Computer Science - 14%, Games - 13% and Software Engineering - 10%.

Number of female students qualifying in IT/ computing degrees has fallen by 10% over the past 5 years

Transitions to employment: 6 months after graduation, 63% of male graduates but only 47% of female IT graduates were in an IT role

Women applicants to computer science compared to other HE courses - all UK universities



Computer Science is most gender segregated!

The Open University

Our students

Most are mature students (only about 8% are under 21). The vast majority study part-time, and all of them at a distance. Most are in employment and a key study motivation is to change or advance their career.

Largest UG programme in the university with 10,000+ students enrolled on modules

Our Computing & IT qualifications

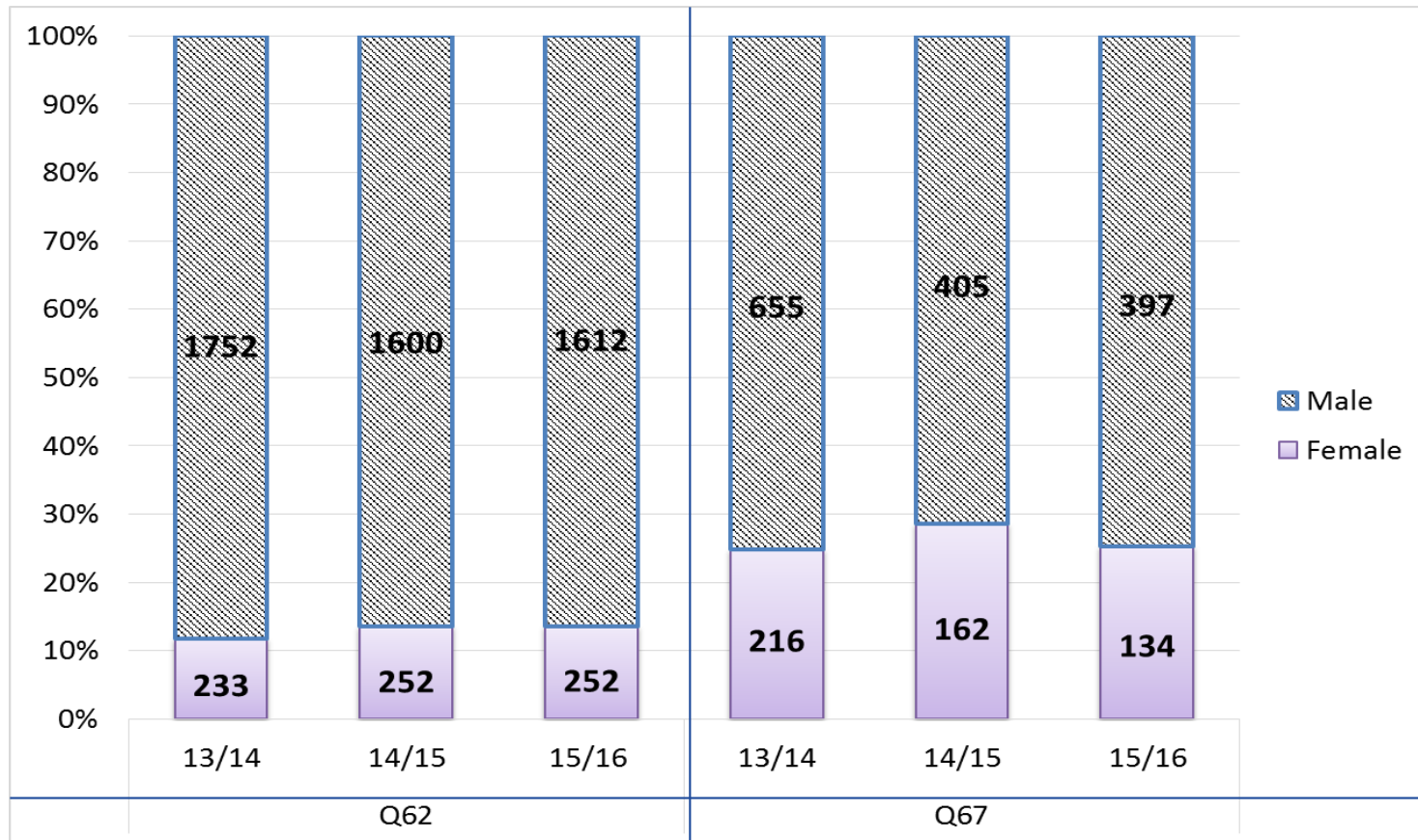
BSc (Hons) Computing and IT (Q62) or BSc (Hons) Computing and IT specialising in **Communications and Networking; Communications and Software; or Software** (Q62)

BSc (Hons) Computing & IT and a second subject (**Business; Design; Mathematics; Psychology; or Statistics**) (Q67)

BSc (Hons) Open is the most flexible programme of study in the UK – study any subjects you like, in any combination and easily change direction if your study interests change

Gendered study patterns

Enrolments by gender for: Q62 - BSc Computing and IT (left columns) and Q67 - BSc Computing and IT and a second subject (on the right).



The UK sector average for female part-time computer science students is 16.0%⁷

Research questions

Why is there such a large difference between the proportion of female students on the joint honours compared to the single honours?

Do female and male students have different motivations for studying?

Do female and male students have different levels of confidence in studying?

Can we make our single honours degree qualification more attractive to women?

Expected outcomes/deliverables:

Advice and guidance for Student Advisors for enquiring/registering students

Advice and guidance for marketing and communications teams

Inform ongoing curriculum strategy and development

Methods

Phase I student focus group to elicit themes for survey questions

Phase II student survey (all students who had completed Key Level 1 module TU100 My Digital Life)

Survey questions explored:

Reasons for enrolment (e.g. required for degree, enjoyment, interest, career intentions)

Confidence with subject (including feelings on gender balance)

Career/previous experience in the IT/Tech sector

Phase III focus group

Recruit participants through the survey

Explore emerging issues in more depth

Recommendations – for staff development and for further actions

Phase 1 student consultation

Aim was to elicit some of the key issues to help form survey questions for the next phase.
Themes included:

Unconventional
career routes into IT

Mix of intrinsic and
extrinsic motivations

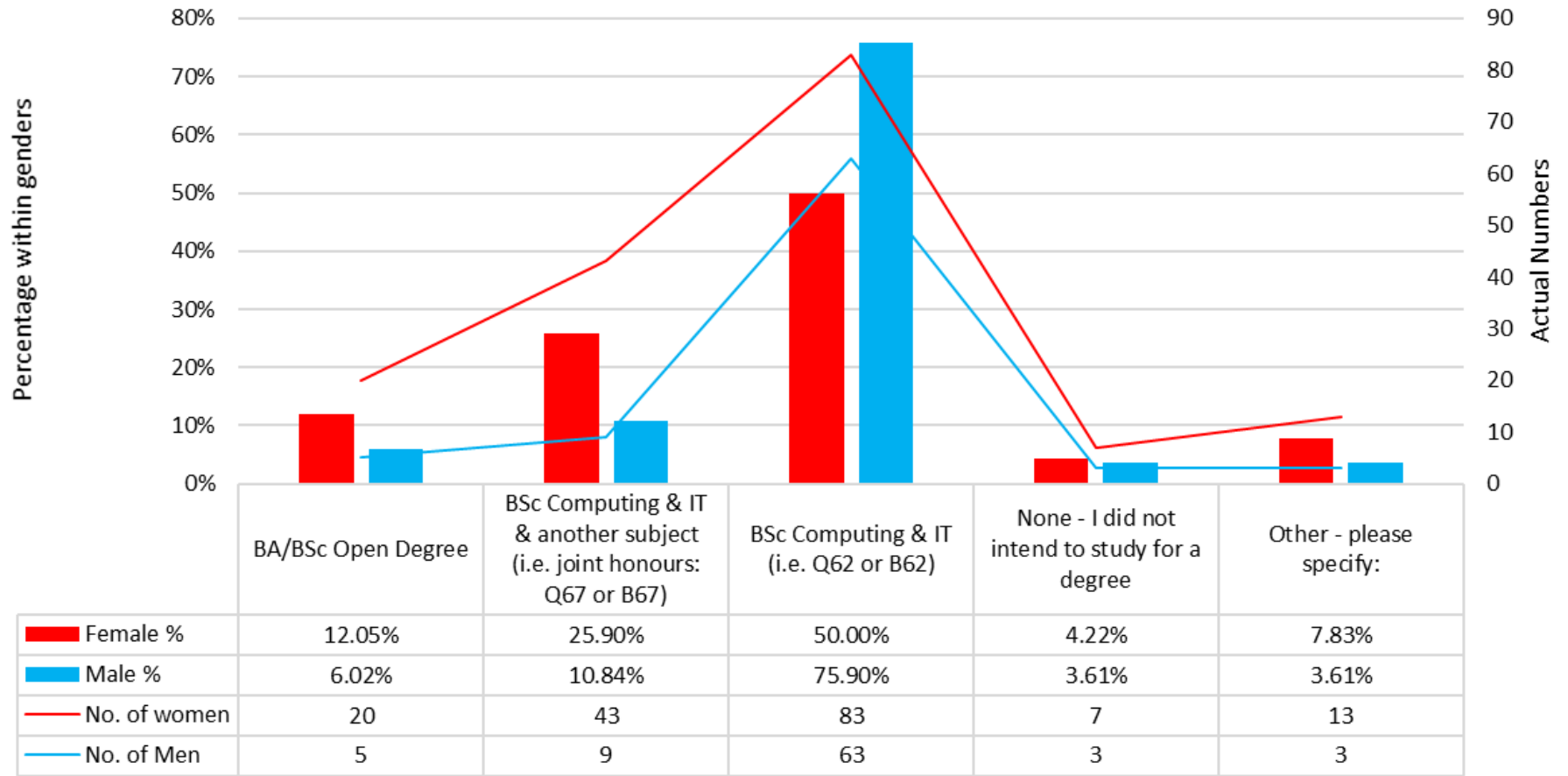
Impact of loan
availability on
degree intention

Issues of confidence
in mixed gender
tutorial groups

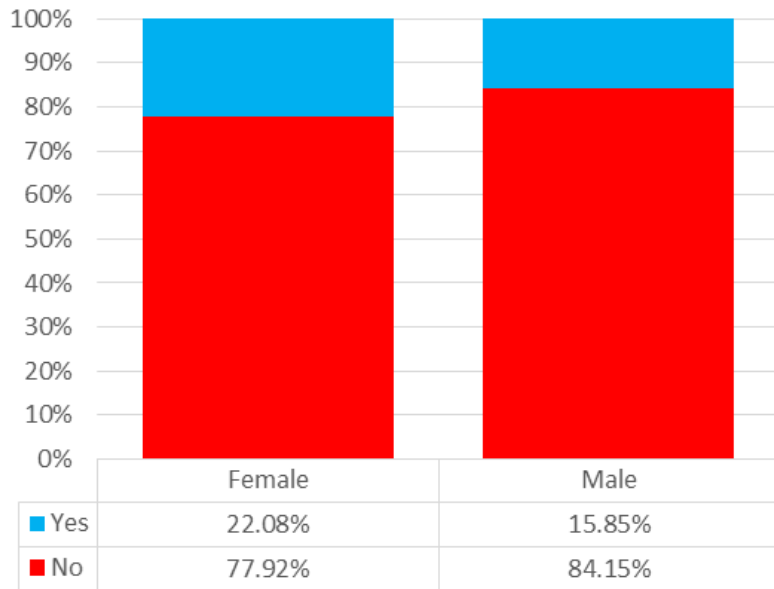
Need for mentoring
and career support

Phase 2 Survey

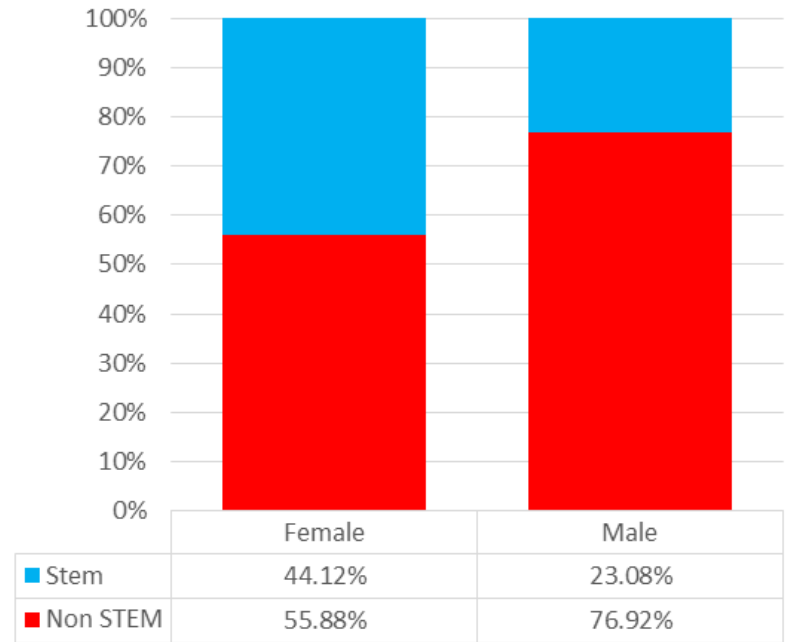
When you registered for TU100: My Digital Life, what was your degree intention?



Did you already have another degree before you started this degree?



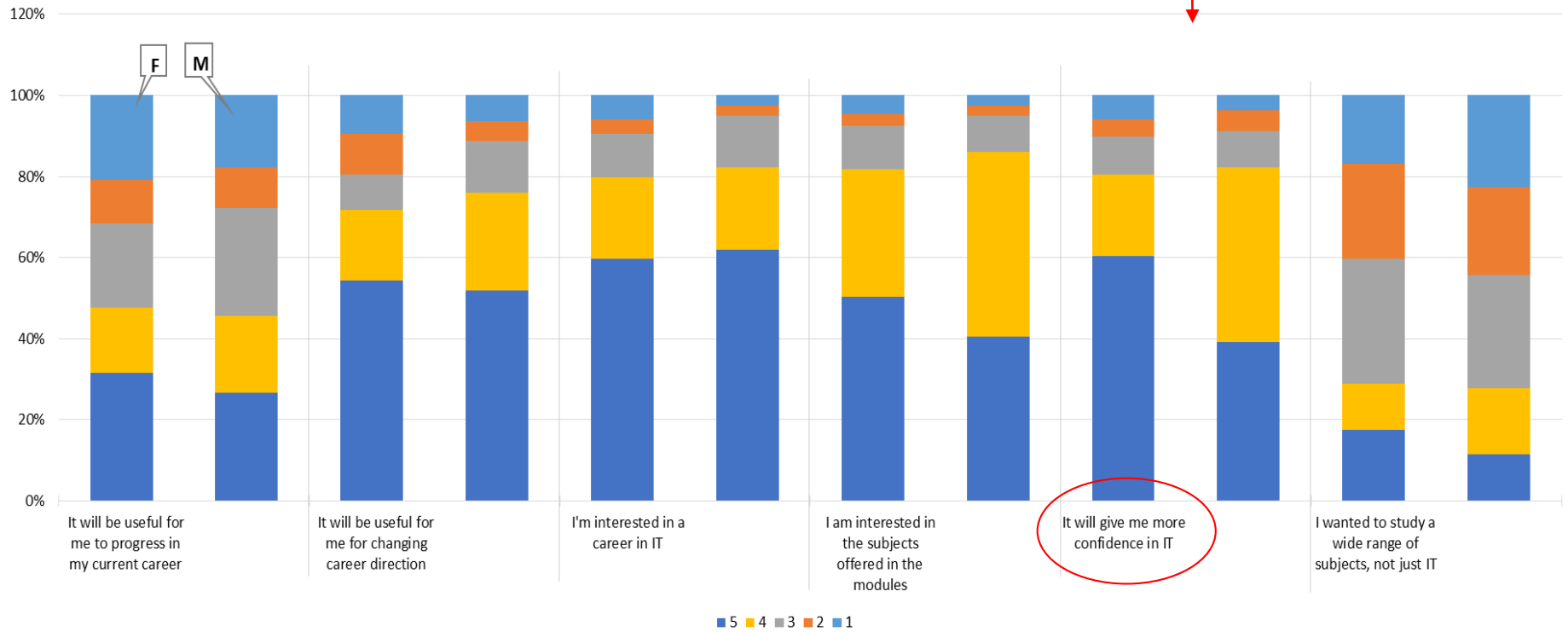
Previous Degree Subject



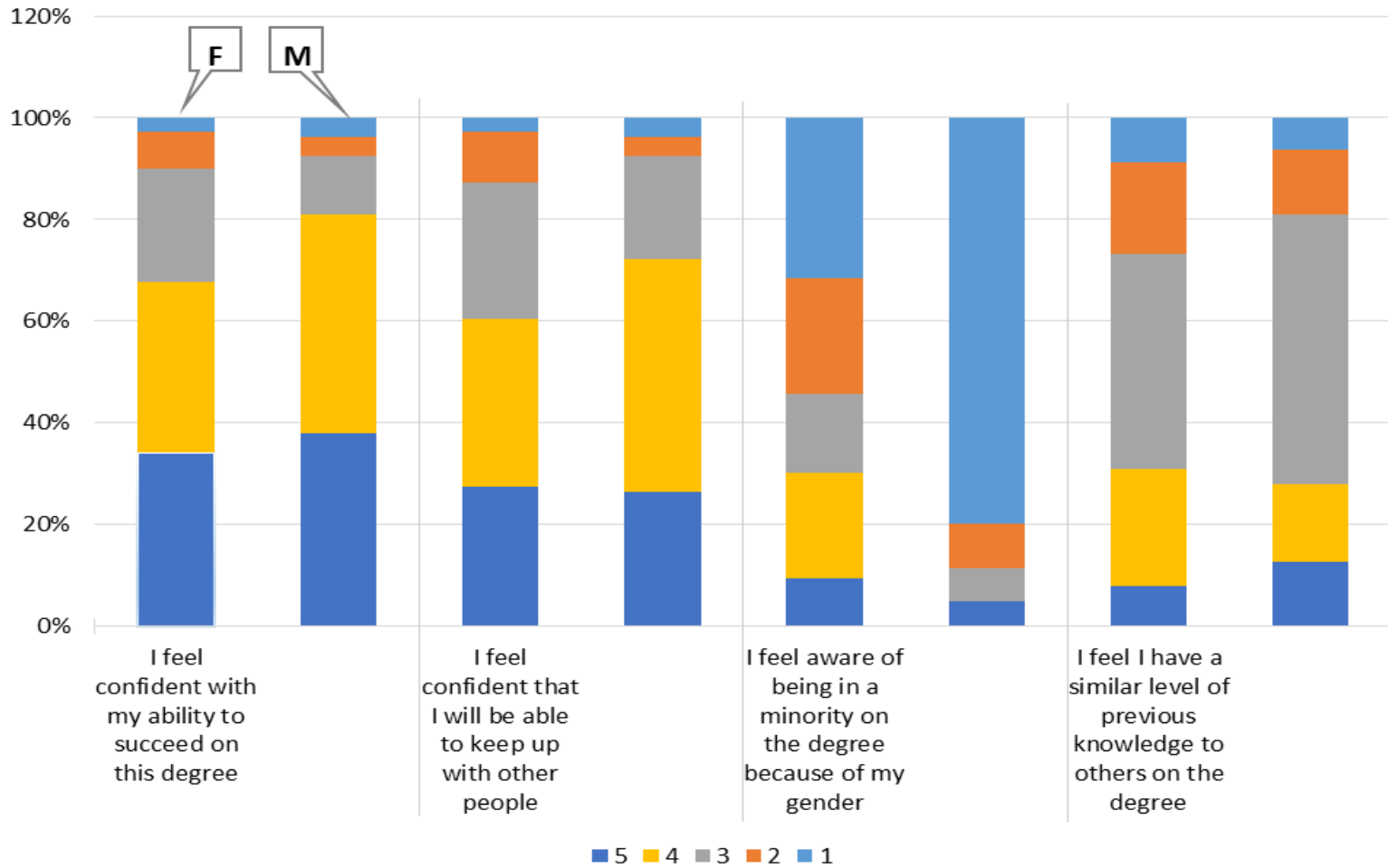
Experience of working in the IT/Tech sector gender differences



Reasons for choosing the degree programme



How do you feel about taking this degree



Focus group issues

Explored **confidence** issues - not about technology skills but more related to returning to study and gaining employment

Career changers – most had previous **careers outside of IT** – so their study was directly contributing to career advancement.

Age as important as gender in perceptions of exclusion

“I don’t know if you could do something to boost confidence, particularly in the older, in the older woman trying to enter this field. I think for me it is, being confident I know a lot of stuff like going for interviews and things and I don’t know, it is just all that confidence building thing, that might just be a personal thing, but when you are faced with a room full of four people interviewing you and they are all men and very tall and have got suits on and are talking techy to you it can be quite daunting”

NEXT STEPS

Research questions

Do female and male students have different motivations for studying?

Do female and male students have different levels of confidence in studying?

Can we make our single honours degree qualification more attractive to women?

Research questions

Do female and male students have different motivations for studying? **YES women more likely to be career changers**

Do female and male students have different levels of confidence in studying? **YES women express lower confidence, which means we need to target extra support**

Can we make our single honours degree qualification more attractive to women? **YES we can take action to change marketing and advice**

Research questions

Do female and male students have different motivations for studying? **YES women more likely to be career changers**

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Can we make our single honours degree qualification more attractive to women? **YES we can take action to change marketing and advice**

Actions

Marketing – changes in the prospectus images

Training carried out with support staff – unconscious bias

Online careers fair for women in IT

Mentoring scheme being planned

Networking event/ student conference

Recommendations for marketing – images in prospectus



COMPUTING
AND IT

BSc (HONS) COMPUTING AND IT

This degree will help you to become a confident user and manager of information technologies; administer and manage network or database systems; and develop software solutions.

Computing and IT skills have become fundamental to the

WHY CHOOSE THIS QUALIFICATION?

- Offers a choice of three specialist routes or a broad-based option.
- Presents focus options within the broad-based route.
- Enables you to choose from routes and modules to meet your particular needs and interests.
- Accredited by BCS, The

“

Studying at the OU has really helped my career and it has been something that I have managed to fit in between having a child and getting married.

Hannah Wood,
BSc (Hons) Computing and IT



BSc (HONS) COMPUTING & IT AND A SECOND SUBJECT

Computing & IT studied together with a second complementary subject can open up careers in a wide range of sectors.

This joint honours degree offers you the opportunity to focus on an area of computing & IT and combine it with business, design, mathematics, psychology, or statistics – dividing your time equally between subjects. Your choice of second subject will be included in the name of your degree, for example, BSc (Hons) Computing & IT and Business

WHY CHOOSE THIS QUALIFICATION?

- Offers a wide choice of computing & IT modules, and options in a second subject.
- Presents focus options within the computing & IT strand.
- Enables you to tailor a study programme to meet your particular needs and interests.
- Accredited by BCS, The Chartered Institute for IT.
- Quality assured by the European Quality Assurance Network for Informatics Education (EQANIE).

“

Thanks to my OU degree, I've more confidence in my ability to achieve. I've also been able to change career and am now a software developer/UX designer for IBM. My employer was impressed with the fact that I was doing an OU degree.

Jack Niland,
BSc (Hons) Computing & IT and Design

COMPUTING AND IT



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Where are we now?

TM111 – new Level 1 Module has more women

All TM111 students Oct 2017	Men 76% (1898) Women 24% (617)
All TM111 students April 2018	Men 76% (1440) Women 24% (462)

But pattern of degree intention is still similar ie women choose the joint degree

Degree Intention		Oct 17		Apr 18	
		M	F	M	F
Q62 Single	Number	957	195	831	159
	%	83	17	84	16
Q67 Joint	Number	386	193	249	133
	%	67	33	65	35

THANK YOU
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