

Women's unconventional routes to ICT work

Digitalization creates new routes to ICT work for women

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What makes women **decide to pursue** a career in ICT?

- Often explored through a “conventional route” from high school to university
- .. and focus on when/how interest in ICT develops
- .. assuming a link between study motivation and interest in ICT
- .. recognized among boys as interest for gaming and programming
- A solution to spark girls’ interest in ICT?
- But: interest for ICT is coded masculine
- Most girls leave high school with no intention of studying ICT!
- Some of these choose ICT at a later point

Studying women's *late* entries into ICT

- Women's **alternative / unconventional routes** into ICT
- .. entering ICT at a later point ...
- .. through routes shaped by gendered barriers
- .. through entry points less affected by masculine stereotypes
- **RQ: What motivates women's alternative and late entries into fields of ICT?**



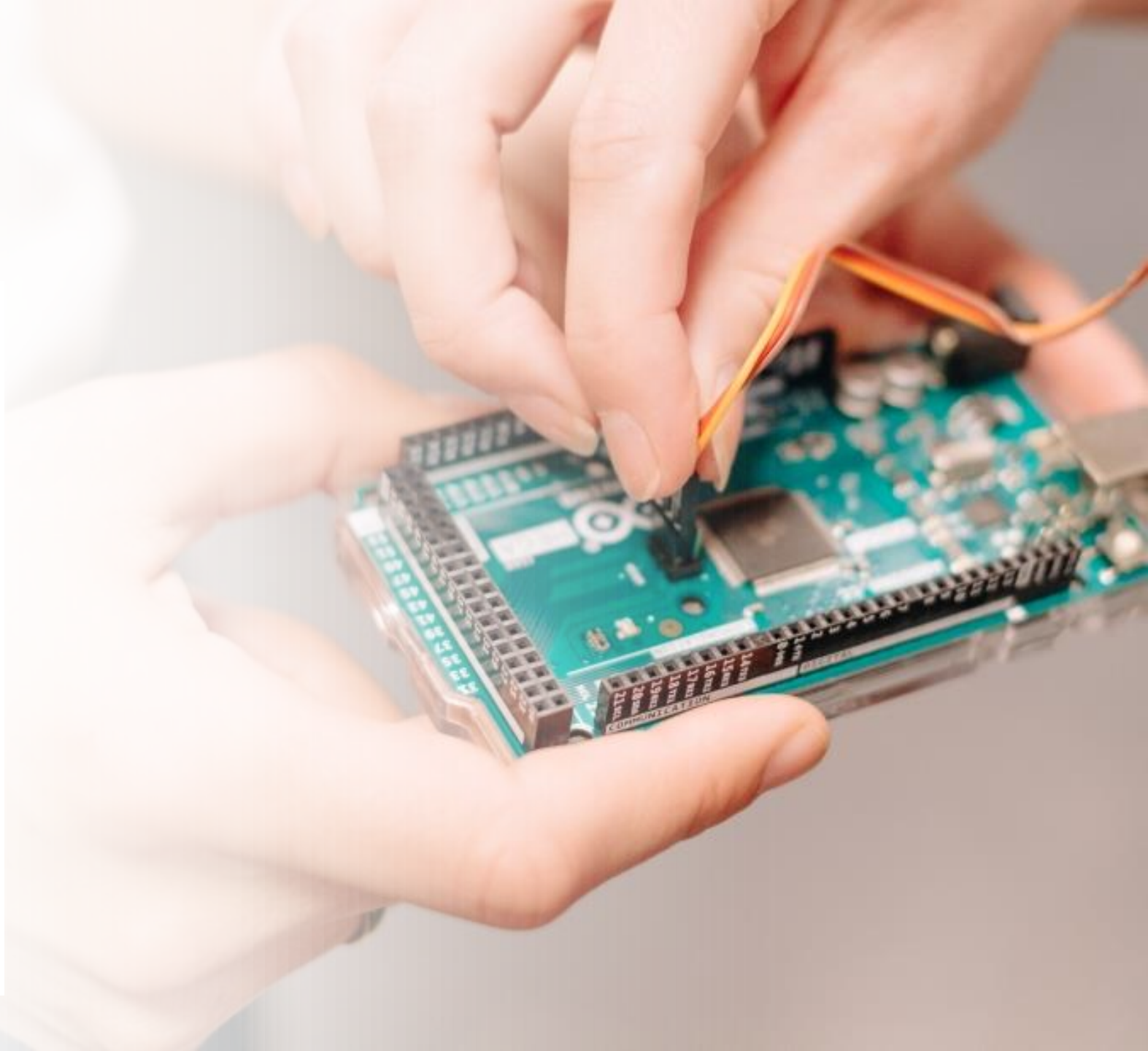
Research framework

- Interviews with **28 women** working with ICT in research and innovation in Norway
 - – in public, private and academic sector
- 11 women had followed a «traditional» («conventional») route from high school to university level ICT education, then to ICT work
- **17 came to ICT via more unconventional routes**
→ these are the women we follow here
- Interviews were transcribed and analyzed with **grounded theory method**: coding, building categories, writing and discussing memos and analytical texts




Research framework

- Feminist technology studies
- Co-construction of gender and technology
- Theories about motivation and predictors for pursuing STEM:
 - cultural stereotypes,
 - interest,
 - ability belief,
 - sense of belonging



	Route 1: Delayed entry into ICT education	Route 2: Digitalization of (non-technical) disciplines	Route 3: Non-technological professions engaged in ICT research and innovation
Education	First degree in a non-technical discipline. Second degree in ICT	Education in disciplines traditionally not recognized as technical	Education in non-technical discipline
Reason for choosing ICT	Support for future work	Necessary or natural change due to digitalization of discipline	New opportunities in digitalization for non-tech professions
Way of acquiring ICT competence	Degree in higher ICT education	Development in original discipline with higher ICT education or workplace-based upskilling of ICT competence	Formal ICT courses and workplace-based upskilling of ICT competence
Current position	ICT expert	ICT expert within original (non-tech) profession	Occupied in original profession in area of digitalization
Current work tasks	Designing, programming, implementing new technology, management	Designing, programming, implementing new technology, management	Designing, implementing new technology, management



When and how did the women enter fields of ICT?

Examples from the three
unconventional routes



Route 1: Delayed entry into ICT education

- Gendered by how the women had *not* chosen ICT education
- ICT as education no. 2
- Transition was related to:
 - Strategic move for work
 - Coincidental (no plan)

Example A: economy to IT

- “The plan was to become an economist [...] But then I also thought that I needed some IT because it is practical. Then I started in information science, and that was a good experience [...], and suddenly I had a Bachelor degree in IT”
- Working as a programmer after the BA:
- “I felt that I was in the right place, because then I got the combination of the analytical side of economics plus that you could work a bit with technology [...] That appealed a lot to me”

Route 1: Delayed entry into ICT education

- Gendered by how the women had *not* chosen ICT education
- ICT as education no. 2
- Transition was related to:
 - Strategic move for work
 - Coincidental (no plan)
- Call for other competences in ICT
- Existing competences as door opener
- Transition *not* related to interest in ICT

Example B: soc.science to ICT

- Advised against ICT, chose social science, later changing to ICT
- “I realised that there were many job announcements asking for a combination of technology and social sciences, so I thought, okay maybe I should choose ICT to combine with the social sciences I already have”
- Working as a programmer
- “it’s great fun with things that you solve, and programming is a bit like solving the crosswords”

Route 2: Digitalization of (non-technical) disciplines

- Non-tech field, like nursing, ped, biol, chemistry
 - Adding ICT competence due to digitalisation of original discipline
 - Either: change of direction as an active choice
- **Example C: nurse + health informatics**
 - “There was a missing link between the job I was going to do [nursing] and the IT department. There was no communication at all and no dialogue. Because I did not understand what they said, and they did not understand what we were saying. And then all of us just thought that all the others were idiots”
 - She became a “translator” between the disciplines

Route 2: Digitalization of (non-technical) disciplines

- Non-tech field, like nursing, ped, biol, chemistry
 - Adding ICT competence due to digitalisation of original discipline
 - Either: change of direction as an active choice
 - Or: natural progression
- **Example D: chemistry and cybernetics**
 - “I started with chemistry but then I chose the subjects with less chemistry, more towards control systems. Therefore, it was a natural transition into cybernetics for me”
 - “a good fit for me”, “enjoyed it a lot”

Route 3: Non-technological professions engaged in ICT research and innovation

- Digitalization as a new opportunity
 - Many in management
 - Digital pioneers combining a non-tech background with ICT
 - Upskilling through work
 - Not ICT expert, but the fabric of digitalization is not just technological
- **Example E: manager in ICT company**
 - “In the beginning I felt like a very 'analogue person’”
 - “there were no answers, so when we were doing this in 2013, we had nowhere to look. No one had done it before, so we have invented this ourselves”
 - Developing their tech skills:
 - “now I feel that I am very technological, that I know a lot about technology”
 - “One of the reasons we have succeeded is that we don’t think about technology as a separate field”

Limitations in the women's relationship to IT

- **Route 1: Delayed..**

- A: “It is not the geeky type of technology. It is a very practical use of technology”
- “For me, technology is a means to accomplish something. [...] So I’m not so into technology as such”
- B: “I’m not programming at home in my spare time or use a lot of time like that on technology”

- **Route 2: Digitalization of..**

- D: “There are more boys and men who sit and spend their leisure time on things like that [programming]. But we [women] use it, and we are interested in it in a work-related setting, but when I go home, I leave it behind at work”

- **Route 3: Non-tech prof in IT**

- E: Not a limitation in herself, but in technology:
- “it is a tool that needs to work in-between, for instance me and you [...] but making it work in a holistic perspective”

What has interest got to do with it?

Interest

- The three late entry points
 - All had a non-tech discipline/prof as a starting point for entering ICT
 - Coincidences
 - A non-tech discipline in transition
 - Non-tech needed in digitalization
- After entering: fun, enjoy, geeky pleasure etc.
- **Interest vs. entry points:**
 - Ex b: interested, but guided away, then a strategic choice
- Interest is **not enough to make women enter fields** of ICT via the “conventional” route
- **Lack of interest is not the main barrier** to women's entry into ICT

Ability belief

- Gradually establishing a sense of belonging: combining first non-tech discipline + ICT
- Establishing ability belief in a field less characterized by masculine stereotypes, or even dominated by women
- Less competition with masculine coded fields of ICT
- Contributing to change in their original field and in digitalization
- A professional hybridity / double competence

Unconventional routes as gendered

Unconventional routes are not reserved for women, but the women experienced this as navigating a *gendered landscape*

Illustrating that interest in ICT is **neither enough, nor a requirement** for women to choose ICT

Are the women illustrating
solutions
or **failed opportunities**
to recruit women into ICT ?

Read more

- Corneliussen, H. G., & Seddighi, G. (*to be published spring/summer 2022*). Unconventional routes into ICT work: Learning from women's own solutions for working around gendered barriers. In G. Griffin (Ed.), *Gender Inequalities in Tech-Driven Research and innovation: Living the Contradiction*
- **Related publications**
- Corneliussen, H. G. (2021). [A Random Choice, Late Discovery, and Penalty Rounds: Mapping women's pathways to information technology education](#). In P. Kommers & M. Macedo (Eds.), *Proceedings of the IADIS International Conferences ICT, Society and Human Beings; Web Based Communities and Social Media 2021; and e-Health 2021* (37-44): IADIS Press.
- Corneliussen, H. G., & Seddighi, G. (2020). [The Challenge of Implementing the National Gender Equality Norm in IT Organizations](#). *IADIS International Journal on Computer Science and Information Systems*, 15(2), 1-14.
- Corneliussen, H. G., & Seddighi, G. (2020). [Employers' Mixed Signals to Women in IT: Uncovering how Gender Equality Ideals are Challenged by Organizational Context](#). In P. Kommers & G. C. Peng (Eds.), *Proceedings for the International Conference ICT, Society, and Human Beings 2020* (41-48): IADIS Press.
- Corneliussen, H. G., Seddighi, G., & Dralega, C. A. (2019). [Women's Experience of Role Models](#) in IT: Landmark women, substitutes, and supporters. In Ø. Helgesen, E. Nettet, G. Mustafa, P. Rice, & R. Glavee-Geo (Eds.), *Modeller: Fjordantologien 2019: Universitetsforlaget*.





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