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Engaging Local Expertise as Role Models to Recruit Girls in Technology

A pilot project for the goal of making Sogn a technology centre

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Introduction: Fostering STEM and IT Skills in the Region

This project note stemmed from a pilot research project that aimed to explore how students, especially girls, in the region can be encouraged to pursue careers in science, technology, engineering, mathematics (STEM) and IT. The project recognized the importance of diversity and inclusion to foster a sustainable innovation ecosystem for a thriving digital and green economy (Rollnik-Sadowska, 2023).

Two key challenges were identified:

- The need to develop necessary STEM and IT skills among the next generation, especially among girls.
- The lack of diversity in the workforce, particularly the underrepresentation of girls in STEM.

To address these challenges, the project focused on exploring how educational institutions and technology companies can collaborate to meet these challenges. Based on the scholarly literature, it has been identified that role models and mentorship programmes are essential to encourage participation in STEM and IT (Corneliussen et al., 2019; De Gioannis et al., 2023). The project identified a significant lack of role models in Norway for girls to pursue careers in these fields (Corneliussen, 2023). Therefore, it focused on exploring if the existing technology workforce can act as "tech moms and tech dads" to inspire and guide the next generation, especially girls, into STEM and IT.

The pilot project investigated how to effectively engage employees and students, and build meaningful relationships between them, with a focus on diversity and inclusion as central to the goal of transforming Sogn into a technology hub.

Based on these broader objectives guiding the work, the pilot project focused on the following three research questions: RQ1: What are the primary

challenges that tech companies face vis-à-vis recruitment in STEM? RQ2: What difficulties do educational institutions face concerning students and their interest in STEM subjects? RQ3: How can new inspirational relationships – tech-mom and tech-dad – address some of these challenges of increasing interest in STEM fields?

The project utilized a qualitative research methodology that engaged relevant stakeholders in the region. This included:

- Interviews with representatives from IT and technology companies and other stakeholders to assess the feasibility of engaging tech experts as role models.
- A discussion meeting with the municipality and representative of educational institutions to reflect on the challenges of engaging students, especially girls, in STEM and IT and explore potential solutions.

The project report analyses the findings from these activities and provides insights into the potential for establishing a meaningful collaboration between educational institutions and technology companies to nurture diversity and inclusion in the next generation of STEM and IT professionals in Sogn.

Skill retention and recruitment decisions are multi-dimensional

Policy discussions often adopt a one-dimensional view of skill training and skill retention, as acquiring know-how or balancing demand-supply of labour as per the industrial or business needs. However, given the regional characteristics, businesses in Sogn have to work with a multi-dimensional view of skill training (McGrath & Powell, 2016), retention and recruitment which involves considerations related to home, building a community, upholding workplace values and accounting for regional affordances.

For the business, the challenge related to recruiting employees with relevant skills is “not just about finding the right skill here but also that Sogn should be a good place to live for those coming in”. This involves ensuring that the region

has an adequate housing market, community life, job market and environment to ensure employment for the partner.

To navigate these challenges, several businesses in the region use their unique location in Sogn as a differentiator in recruitment “both in how we recruit and how we differentiate ourselves from others”. That is, they actively work to build a workplace identity that is strongly tied to the regional identity as a small, “koselig”, family-friendly place.

These efforts also translate into practice and influence how businesses engage with questions of sustainability at the workplace. For instance, one organization actively implemented a workplace policy to commute using electric bikes and most of the employees had actively complied “because it was easier to do it in Sogn”. The need to use the region as a differentiator also inspired some businesses to play an active role in building a “tech-driven community” in the region by organising social activities, knowledge-sharing sessions and community visits to create a sense of belonging and engagement among employees and other actors in the region. Thus, for the businesses in Sogn, the question of skill recruitment and retention is multi-dimensional and place-based and depends on how attractive Sogn is for those moving in.

The challenges related to skill development and skill retention are multi-dimensional and place-based and will become more so in the context of green and digital transition (Carr, 2023). Addressing these challenges will require a holistic attitude involving both developing technical competence in the region as well as its unique social and ecological characteristics to make it attractive.

Different actors work with diverse notions of diversity and inclusion

When discussing challenges around equality, diversity and inclusion, different actors respond differently. The pilot project identified three types of responses through which questions of diversity, equality and inclusion are understood. First, the question is understood through the vocabulary of sustainability and offering good ‘working conditions’ at the workplace. Discussing and debating

sustainable practices at work also becomes a central site for discussing workplace values, engagement and inclusion. For instance, one business pointed out that dedicating one day as a 'delete day' at the workplace as an example of shifting workplace values and work processes through democratic engagement. Also, they highlighted how they like to maintain a long-term relationship with offshore freelancers and do not use the platform's "precarious infrastructure to hire freelancers. Second, the question of inclusion and diversity is tackled by discussing managerial practices and organizing "silly social events" to make the workplace a 'safe space' where anyone can feel free to be themselves. Third, the question is understood from the lens of formal as opposed to substantive equality (Fredman, 2016; MacKinnon, 2016) to suggest that everybody is equal, and nobody is discriminated against.

While these are all valid interpretations of the question of diversity and inclusion, they hinder several actors from explicitly tackling the challenge of low representation of girls and women in IT and STEM fields at the workplace or even recognising that this is a challenge that has not been addressed in the region and requires direct intervention. This is a glaring lack given that most businesses either had no or very few women in their core tech teams.

Need for proactive mentorship programmes to involve girls in IT

Our discussions with educators and women working in technology fields foregrounded the need for affirmative action to bring more women into the field of science and technology. In our discussion with educators, several challenges were foregrounded. First, the success of coding education in schools in Sogn is highly dependent on having teachers with resources to make coding engaging for everyone, and there is a shortage of available resources that can engage students over a long period. Second, despite the discourse on gender equality as one of the values guiding the society in Norway, it is believed girls in Sogn often have lower self-confidence in their technical abilities, believing that boys are better at IT. Third, girls in this region tend to follow their friends and conventional paths when choosing educational paths, which can make it

challenging to instil interest in STEM and IT unless there is a collective interest. There's also an absence of female role models in Norway which discourages girls from pursuing careers in technology as it gets deemed unconventional.

To break away from the uninterrogated stereotypes, unsaid inhibitions, and fear of standing out, especially among girls in Sogn, there's a need to build proactive actionable mentorship programmes that can tackle these challenges head-on (Corneliussen, 2023). Our interviews with women in technology in Sogn suggest that while recruitment and educational camps organized by public and private sector companies and educational institutions did help them in their career path, they couldn't recount receiving any explicit support from the teachers who could inter-weave their expansive interests in design, arts, science and technology, break the male-dominated stereotypes characteristic of technology subjects and expose them to several career opportunities possible in the field of STEM and IT.

Shift in Values: From Formal to Substantive Equality

These challenges, which are often also identified in the scholarly literature on involving girls and women in IT and STEM, present several opportunities to work with the project's initial hypothesis of using existing technology employees in the region as mentors. The presence of certain stereotypes, unsaid values and assumptions as well as the absence of female role models can discourage girls from pursuing careers in technology. Inspirational relationships like tech-mom and tech-dad can fill that gap and provide the necessary role models. Becoming aware of the life trajectories of existing employees in the region can present students with several possibilities to weave their diverse and expansive interests and find the right fit. An understanding of how their "tech moms" and "tech dads" weaved their interests and the challenges and stereotypes they faced in the process can help boost

girls' confidence in their technical abilities. Often at the school level and in popular discourse, a distinction is made between “hard” science and technology subjects and “soft” arts and humanities subjects. Teachers try to identify students' “natural” inclinations. However, these decisions are not natural but depend on social and cultural assumptions made about men and women.

Moreover, even the fields considered to be female-dominated such as nursing, design, and humanities will change rapidly due to digital transition and the next workforce entering these sectors will need IT skills to critically engage with technology for their core tasks. Exposure to different professional roles and career trajectories will allow students to weave their varied interests with technology. Moreover, by talking to professionals working in the region, the students can become aware of this region as their future workplace.

Despite the opportunities, however, it will not be easy to mobilize existing employees to play the mentorship role as tech dads and tech moms. The pilot project helped identify several challenges concerning this. Given how questions of inclusion and diversity are understood through the limited vocabulary of sustainability, formal equality and workplace culture, mentors will need to be trained to a) understand the limitations of these interpretations and work with an expansive notion of inclusion and diversity beyond sustainability, workplace safety and formal equality, b) recognize the need for proactive action in schools and organizations to bring more girls from Norway into technology and c) understand that proactive action doesn't hinder but contributes to practices of substantive equality d) understand how their life-narratives and mentorship role is necessary to address systemic barriers through targeted measures. There's also a need to ensure that their role as mentors helps them better understand their work practices and culture and adds value to their work and organization. Similarly, businesses will need to identify the role of diversity in technology and innovation. The mentorship program will have to find the right balance between different business needs and explore the added value of involving young people in the process to ensure that it's beneficial for all the stakeholders involved. This will involve regular knowledge-sharing sessions

between teachers, mentors, employers and administrators to build a sense of community and engagement and encourage long-term investment.

References

- Carr, C. (2023). Repair and care: Locating the work of climate crisis. *Dialogues in Human Geography*, 13(2), 221–239.
<https://doi.org/10.1177/20438206221088381>
- Corneliussen, H. G. (2023). *Reconstructions of Gender and Information Technology: Women Doing IT for Themselves*. Springer Nature.
<https://doi.org/10.1007/978-981-99-5187-1>
- Corneliussen, H. G., Seddighi, G., & Dralega, C. A. (2019). 18. Women’s Experience of Role Models in IT: Landmark women, substitutes and supporters: Fjordantologien 2019. In Ø. Helgesen, R. Glavee-Geo, G. Mustafa, E. Nettet, & P. Rice, *Modeller* (1st ed.). Universitetsforlaget.
<https://doi.org/10.18261/9788215034393-2019-18>
- De Gioannis, E., Pasin, G. L., & Squazzoni, F. (2023). Empowering women in STEM: A scoping review of interventions with role models. *International Journal of Science Education, Part B*, 13(3), 261–275.
<https://doi.org/10.1080/21548455.2022.2162832>
- Fredman, S. (2016). Substantive equality revisited. *International Journal of Constitutional Law*, 14(3), 712–738.
<https://doi.org/10.1093/icon/mow043>
- Mackinnon, C. A. (2016). Substantive equality revisited: A reply to Sandra Fredman. *International Journal of Constitutional Law*, 14(3), 739–746.
<https://doi.org/10.1093/icon/mow047>
- McGrath, S., & Powell, L. (2016). Skills for sustainable development: Transforming vocational education and training beyond 2015. *International Journal of Educational Development*, 50, 12–19.
<https://doi.org/10.1016/j.ijedudev.2016.05.006>
- Rollnik-Sadowska, E. (2023). Labor market in sustainability transitions: a systematic literature review. *Econ. Environ.*, 87(4), 1–31.
<https://doi.org/10.34659/eis.2023.87.4.681>