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Where are the girls? reflections on gender and technology education

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Across many countries, technology classrooms continue to reflect an imbalance, with boys far more present than girls. This is hardly a new observation; it has been noted for decades. Nevertheless, the fact that it persists raises troubling questions. Why does this pattern sustain, and what kinds of research might finally help shift it? I do not aim here to provide a review of all the past work, but rather to extend an invitation. An invitation for us, as an international community, to reflect together on why gender remains a pressing concern in technology education and how our research can contribute to more inclusive futures. Technology education is never only about the what, why, or how of subject knowledge. It is also about who is invited into the field, who is recognised as capable, and under what conditions students come to see themselves as participants. This means that our research should do more than analyse differences; it should also seek to explain them in new ways and help us ask who is absent, who is struggling for recognition, and how the conditions of participation are being shaped.

One explanatory narrative for girls' underrepresentation in technology education that I hear repeatedly is that girls are "less interested" in technology. It is presented as if interest were a gendered trait that girls inherently lack and must somehow acquire. Boys, however, are rarely described in these terms; their participation is seldom questioned in relation to interest (Sultan, 2024). Research within our field shows that interest is not an innate or fixed quality. It is a subjective, emotional, and cognitive experience that develops over time and is shaped by context, opportunities, and exposure. Measuring interest is further complicated by cultural and gender biases, as well as by unequal access to experiences that allow curiosity to grow (e.g. Holmegaard & Archer, 2022), which both makes us researchers brave but also perhaps somewhat naïve when pursuing interests as sole explanations for girls' underrepresentation. Girls' access to knowledge and opportunities available to them are often more limited than those available to boys. Framing the challenge as one of disinterest among girls' risks pushing us towards "fixing the girls" results rather than addressing the systemic barriers that shape participation.

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For those girls who do step into technology classrooms, the experience is often marked by subtle exclusions and low expectations. Some must constantly negotiate their right to belong; others are positioned as exceptional, placed on display as proof of inclusion, and turned into poster girls for design and technology (e.g., Godec et al., 2024). Neither position offers the same taken-for-granted legitimacy that boys enjoy. I remember one girl describing how, when her group was building a vehicle prototype, she suggested adjustments to the gearing. The teacher praised her creativity but then steered her toward designing the paint scheme, saying she had a “good eye for that.” Her technical insight was reinterpreted as an aesthetic contribution, and the task was effectively girlified. On the surface, this appeared to be inclusion. In practice, it displaced her from the core of the project and reaffirmed the stereotype that girls belong at the margins of technical work. But there are other moments too. In another classroom, a girl insisted on troubleshooting the coding of a robotic arm that kept stalling. The boys in her group initially dismissed her suggestion that the error lay in the sensor calibration. She stayed with the problem, rewrote a section of code, and the machine came to life. The teacher paused the class to highlight the solution. In that moment, the dynamic shifted as her technical competence became visible to everyone, not as an exception, but as an important part of the project. What struck me most in listening to her afterwards was her relief at being recognised simply as a competent contributor and not as “the girl who solved it”.

Looking across our beautiful field of research, I see three persistent gaps. First, gender too often appears only as a descriptive category. Studies may report differences between boys and girls but rarely draw on gender theory to probe how such differences are produced, maintained, or contested. Second, much research is still conducted with an invisible border between the researcher and the researched. I would like to see more studies where the research is conducted closer to the girls, in their own settings, to gain a deeper understanding of how they explore and learn technology on their own terms. Third, when girls are studied directly, they are often portrayed as a homogeneous group, as though their experiences were all the same. This overlooks what can be important intersections of class, disability, and other factors that shape diverse pathways through technology education.

So how might we proceed differently? I believe it is valuable to strengthen our theoretical grounding. Every dataset, whether from a classroom study or a national survey, should be viewed through the lens of gender or critical theory if wanting to understand gendered patterns. Otherwise, inequities can remain hidden in plain sight. We can also explore more questions of belonging. Engagement in technology is not only about learning skills. It is about whether students feel recognised, whether their contributions are valued, and whether they can imagine futures that include technology. Here, we can draw inspiration from examples of gender research in engineering education, which demonstrate the powerful tools that data on identity, recognition and belonging can be. At the same time, we can also focus on systematic barriers, rather than just school settings. When we ask, “Why don’t girls choose technology?” we risk slipping into deficit thinking, as though the problem exists in the girls themselves. A more pressing task is to examine the signals sent by guardians, society, and policies (e.g., Hudson et al., 2019). What opportunities are being opened up, and what doors are quietly being closed? And finally, I see the need for methodological diversity. Surveys, interventions, and campaigns have their place, but they cannot on their own capture the full complexity of gender. Longitudinal work, ethnography, and observation are needed to complement large-scale data and to bring lived experiences into a deeper understanding. I

am not suggesting that every study in technology education must explicitly focus on gender. However, I am convinced that no study should be blind to it. Our framing choices, our methods, even the questions we do not ask, all shape the knowledge we produce. If we leave gender unexamined, we risk producing a distorted picture in which boys' overrepresentation is taken as normal. That is not only a missed opportunity, but also a failure of responsibility. The challenge is not to spark new interest in girls, as if it were absent. The challenge is to create conditions in which the existing interest can flourish.

Each year, new cohorts of young people step into our classrooms. Some individuals feel immediately at home, while others must fight for recognition, space, or legitimacy. Our research cannot end all societal inequalities, but it can shed light on them. It can make them visible, question them, and point toward more inclusive possibilities. My hope is that, as a community, we will continue to ask hard questions, reflect critically on our practices, and contribute to a technology education that truly includes all learners.

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