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Women in Tech Taskforce: Building a future tech sector that works for everyone

Evidence submitted by XR Stories
and XR Network+, University of York

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Rosario Neyra, Jay Harrison, Emma Brown,
Damian Murphy

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About us

The University of York is a world-class research institution, with strong links to the Creative and Cultural Industries and has for more than 20 years conducted applied research at the convergence of engineering, science, arts, humanities, and social science. This work is University-wide with particular strengths in the School of Arts and Creative Technologies, the School of Physics, Engineering and Technology, and the Departments of Computer Science and Psychology.

Based at the University of York, XR Stories was founded as an Arts and Humanities Research Council (AHRC) funded Creative Industries Cluster Partnership (CICP) and between 2018-2024 it provided £3.5m of funding to small and medium-sized enterprises (SMEs) working in virtual production (VP) and extended reality (XR) in Yorkshire and the Humber. It continues to provide researchers, companies, creatives and cultural organisations with access to expertise, infrastructure and facilities to unlock the potential of XR and next generation convergent media technologies. XR Stories also leads the 2022-2027 Engineering and Physical Sciences Research Council (EPSRC) XR Network+ VP in the Digital Economy project, which brings together five universities to undertake research into the future of VP and to fund co-created projects between academia and industry.

The work of XR Stories builds upon a series of major research projects relating to creative technologies at the University of York. Since 2014, the EPSRC Intelligent Games and Game Intelligence Centre for Doctoral Training has been developing the next generation of interdisciplinary researchers, designers, developers, and entrepreneurs for the games industry. From 2015-2022 the EPSRC/AHRC/Innovate UK (IUK) funded Digital Creativity Labs worked with Creative Industries partners to maximise impact from research in digital games, interactive media and AI. From 2020-2024 the Research England Screen Industries Growth Network (SIGN) introduced a portfolio of research, skills development, business support and diversity and inclusion interventions to complement XR Stories. Most recently, 2023 saw the launch of the University of York led CoSTAR Live Lab, one of five labs forming a connected infrastructure, funded by AHRC to support future R&D in the screen and live performance industries.

Introduction

The evidence presented in this document draws on applicant and award data from seven XR Network+ funding calls delivered between 2023 and 2025, comprising a total of 169

applications and 50 funded projects. These calls varied in scope, eligibility, and award size, ranging from smaller prototyping grants (£10,000–£25,000) to larger collaborative R&D awards (£60,000–£75,000). Applicants were invited to complete an optional equality, diversity and inclusion (EDI) monitoring form, which collected data on age, gender, ethnicity, sexual orientation, disability status, and social class. The analysis presented here draws on these monitoring data alongside application and funding outcomes.

This work forms part of a broader programme of activity focused on equitable funding design within XR Network+. Through funding provided by Valuing Voices¹, we undertook an audit of our funding practices ahead of the XR Labs Fund call² (launched in September 2025). This audit mapped nearly 70 interaction and decision points across the funding lifecycle, from scheme design and advertising through to review and decision-making. Alongside this, a targeted review of existing research on barriers to participation in research funding was conducted, and the team undertook training in the ‘Foundations of Equitable Project Design’ delivered by Ida XR Studio³. Based on this work, 16 changes were implemented across six stages of the funding process ahead of the XR Labs Fund call, with the aim of improving equity and encouraging participation from a wider range of applicants.

The evidence presented in this document draws from applicant and award data from multiple XR Network+ funding calls⁴. These data provide insight into who applies for, and succeeds in, research and innovation funding in emerging technology areas, particularly in fields such as virtual production, as well as how distribution of participation changes in response to changes in funding processes. The findings presented here are primarily descriptive. They identify application patterns and highlight where differences are most pronounced, but they do not establish causal relationships between specific interventions and outcomes. Nonetheless, they offer insight into how factors such as gender, age and social class intersect to shape participation in innovation and R&D funding within emerging technology sectors.

Additional reports from SIGN are used to supplement the analysis of applicant monitoring data. The reports include evidence on employment and skills gaps in the games industry⁵, the future of innovation in convergent media and VP^{6, 7}, and working time and labour conditions in

¹ <https://www.york.ac.uk/research/valuing-voices/>

² <https://xrnetworkplus.xrstories.co.uk/grant/xr-labs-fund/>

³ <https://www.idaxrstudio.com/>

⁴ Neyra, R. & Palmer, S. (2026) *Designing more inclusive funding calls: Evidence, lessons and future directions*. XR Stories. Available at:

https://xrstories.co.uk/wp-content/uploads/2026/04/XR_Stories_EDI-Report_March-2026-DIGITAL.pdf

⁵ Jones, B., Swords, J. & Brereton, J. (2023) *Employability Expectations in the Video Games Industry*. SIGN. Available at:

https://screen-network.org.uk/wp-content/uploads/2023/12/58955_Gaming-Industry-Employability_Digital_HR.pdf

⁶ Willment, N., Murphy, D., Black, S., Mothersdale, G., Harris, J., & Terras, M. (2024). *Innovation in Future Convergent Media and Virtual Production Technologies: Reporting from XR Network+ Workshops 2023/4*. Zenodo. <https://doi.org/10.5281/zenodo.13890675>

⁷ Willment, N., Swords, J., & Thomas, B. (2023). *The Evolution of Virtual Production? Issues and Opportunities*. XR Stories. Available at:

https://xrstories.co.uk/wp-content/uploads/2023/11/The-Evolution-of-Virtual-Production_final.pdf

the UK television industry⁸. These sources provide a broader evidence base for understanding how structural conditions within the sector may shape who applies for, and succeeds in, emerging technology roles.

The evidence is most relevant to questions relating to skills, career pathways, and participation in the tech sector, and the responses that follow focus on these areas.

Response to selected questions

To what extent, if at all, are emerging technologies changing the skills required in your organisation or sector?

To a great extent

Please describe the specific changes you are seeing in the skills required in your organisation or sector as a result of emerging technologies.

Emerging technologies, particularly VP and generative AI, are reshaping the skills required across the screen and creative technology sectors by changing how production is organised, how different disciplines interact, and what kinds of knowledge are needed to deliver projects⁹.

These new technologies are increasing the convergence of film, television, and games, creating new demands for cross-disciplinary working. Practitioners are increasingly required to collaborate across sectors that have historically operated with different tools, processes, and professional languages, creating a need for people who can bridge these differences and support communication across creative, technical, and production contexts.

One of the most significant consequences of this convergence is a shift in production workflows. Virtual production enables activities such as virtual location scouting and real-time collaboration within shared digital environments, allowing teams to work remotely during production. There is also an increasing demand for skills that combine creative practice with technical capability, particularly in relation to real-time game engines and digital production pipelines.

These changes are taking place within a context of ongoing skills shortages and structural constraints. Evidence from the games sector, whose skillsets are increasingly in demand as virtual production is adopted more widely, indicates longstanding gaps in areas such as programming, animation, and technical production, alongside a persistent mismatch between educational provision and industry needs¹⁰. At the same time, there is growing demand for

⁸ Swords, J., Mayne, L., Boardman, C. & Ozimek, A. (2022) *The Time Project: Understanding working time in the UK television industry*. SIGN. Available at: <https://screen-network.org.uk/wp-content/uploads/2021/02/The-Time-Project-Pilot.pdf>.

⁹ Willment et al., 2024

¹⁰ Jones et al., 2023

business skills, including financing, project development, and planning, reflecting the complexity of delivering work in these multi-disciplinary environments. These challenges are further exacerbated by the pace of technological change, particularly in relation to generative AI, which is increasing the need for knowledge of intellectual property, contracts, and rights management, while also introducing uncertainty that makes it more difficult to establish stable training pathways or long-term workforce planning¹¹.

In addition, limited understanding of emerging production methods among key decision-makers, including broadcasters, funders, and distributors, can act as a constraint on adoption. This can reduce opportunities for practitioners to develop and apply new skills, particularly where investment in unfamiliar formats is perceived as high risk.

To what extent, if at all, are emerging technologies leading to new or significantly changed roles in your organisation or sector?

To some extent

Please describe any new or significantly changed roles emerging in your organisation or sector due to emerging technologies.

VP is contributing to changing roles, with practitioners required to work across traditionally separate domains. Roles such as directors, designers, and producers increasingly require an understanding of digital production pipelines, enabling them to work effectively within real-time, iterative environments. Furthermore, there is increasing demand for writers and storytellers able to work with VP-specific narrative forms¹².

There is also a growing demand for individuals who can operate across sectoral boundaries, acting as translators between film, television, games, and technology. As these sectors converge with the increasing adoption of VP, the ability to navigate and operate within different professional languages, tools, and workflows has become increasingly important for project development and delivery. These changes also require ongoing training and support for both new entrants and existing practitioners, particularly in enabling movement across industries, where skills developed in one area (e.g., games) are increasingly applicable in others (e.g., screen).

Additionally, there is some evidence that virtual production may have positive implications for equality, diversity and inclusion. For example, studio-based production and the potential for remote collaboration may reduce some of the barriers associated with location shooting, particularly for those with caring responsibilities or accessibility needs, and may enable participation from a wider geographic base. However, these benefits remain unevenly realised

¹¹ Willment et al., 2024

¹² Willment et al., 2024

in practice. Current evidence suggests that virtual production continues to reflect many of the structural inequalities present in the wider film and television industries, including gender imbalance, regional concentration, and barriers related to access to equipment and training¹³.

In your experience, to what extent are changes to skills, roles or career pathways due to emerging technologies affecting who applies for, or succeeds in, tech roles within your organisation or sector?

To some extent

Please describe the changes you are noticing in who applies for, or succeeds in, different tech roles? What do you think may be driving these changes?

Drawing on XR Network+ funding data, we have found that the majority of applications come from mid- to late-career applicants, with those aged 40–49 forming the largest group (33.7%), followed by those aged 30–39 (27.1%) and 50–59 (20.5%). Applications from those aged under 30 (6.0%) and over 60 (3.6%) were comparatively limited. This suggests that engagement with research and innovation funding in these areas is most common among mid- and late-career researchers, rather than those at early stages of their careers.

In terms of gender, men accounted for the majority of applicants (56.2%), followed by women (30.8%) and a small proportion identifying as non-binary (2.4%). Among funded projects, the proportion of women increased slightly to 38%, with men accounting for 54%. This distribution broadly reflects patterns observed in the wider creative industries workforce, where women remain under-represented, accounting for 37.4% of workers in 2024¹⁴, compared to 48% across the UK workforce overall¹⁵. It also compares favourably to Innovate UK funding application data, where women represented 29% of applicants and non-binary applicants less than 1%¹⁶. It is also important to situate these findings within the broader sectoral context. Virtual production operates at the intersection of the creative industries and digital and technology sectors, the latter of which typically shows lower levels of gender diversity. As such, taken from this perspective, the gender profile of applicants may reflect the combined influence of these overlapping sectors.

¹³ Willment et al., 2023

¹⁴ DCMS (2025). DCMS Sector Economic Estimates: Employment, January 2024 to December 2024.

Available at:

<https://www.gov.uk/government/statistics/economic-estimates-employment-january-2024-to-december-2024-for-dcms-sectors/dcms-sector-economic-estimates-employment-january-2024-to-december-2024>.

¹⁵ ONS (2023). Diversity in the labour market, England and Wales: Census 2021. Statistical bulletin.

Available at:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/diversityinthelabourmarketenglandandwales/census2021>.

¹⁶ Innovate UK (2024). *Innovate UK applicant diversity data 2022 to 2023*. Available at:

<https://www.ukri.org/publications/innovate-uk-applicant-diversity-data/innovate-uk-applicant-diversity-data-2022-to-2023/>.

Written evidence from the University of York

In terms of ethnicity, the majority of applicants identified as White (68.1%), with smaller proportions identifying as Asian or Asian British (11.2%), Black and Black British (2.4%), or Mixed (3.6%). Participation from racially minoritised groups broadly reflects sector-level patterns, although Black and Black British applicants remain under-represented when compared to the UK population and, to a lesser extent, the creative industries workforce.

For sexual orientation, 64.5% of applicants identified as heterosexual and 10.7% as LGBTQ+, although a relatively high proportion (16.6%) selected 'Prefer not to say'. This level of non-disclosure is not uncommon for categories such as sexual orientation, but it is something that needs to be taken into account when interpreting the data. A similar pattern of non-disclosure is observed for disability, where 14.8% of applicants reported a disability, 65.1% reported no disability, and 13.6% selected 'Prefer not to say'.

Social class data show that applicants were most likely to identify as middle class (52.1%), with smaller proportions identifying as working class (16.6%), and a substantial proportion (23.1%) choosing not to disclose.

Overall, most applications were received from middle-class applicants, although this was more pronounced among men (62.1% of male applicants identified as middle class) than women (where 50.0% of female applicants identified as middle class). Correspondingly, the proportion of working-class applicants was larger among the female applicants (23.1% compared to 14.7% of men). Within this overall pattern, applications were particularly concentrated among middle-class men in the 40–49 age group, which accounted for 13.6% of all applications. By contrast, the largest group for women, late-career (50+) middle-class applicants, accounted for 5.9% of all applications. Within the male category itself, the second largest single group is middle-class 30–39 year olds (18.1%), followed by late-career middle-class applicants (16.0%). Women applicants, by contrast, are more dispersed across both career stage and class. While middle-class women are also most represented in the 40–49 (16.3%) and 50+ (20.4%) groups, there is comparatively greater representation of working-class women in the 30–39 (10.2%) and 40–49 (8.2%) groups, which is less evident among men (3.2% and 6.4% respectively). Rates of non-disclosure ('Prefer not to say') are also higher among women (25.0%) than men (21.1%), with the largest difference seen in early-career applicants. This indicates that rates of application vary not only by individual characteristics, but also by how these characteristics intersect.

Across all characteristics, the profile of funded applicants broadly mirrored that of the applicant pool. This indicates that differences in representation are primarily driven at the application stage, rather than particular biases at the review and decision stages. However, it is important to note that funding decisions for XR Network+ are not made on the basis of

numerical scores alone. In cases where applications are closely matched, a portfolio approach is adopted, taking into account a wider set of considerations such as gender, geography, and career stage. As such, the observed similarity in applicant characteristics between applications and funded projects may, in part, reflect the portfolio approach.

At which stages in education or work do you think support is most important for helping women and people from under-represented groups enter, stay in, and progress within the tech sector?

Early-career development

Returning to work after time out (parental leave, caring responsibilities, illness)

Please tell us why you think these stages matter, and what contributes to women or people from under-represented groups facing barriers at these points.

For early-career researchers, first-time applicants and technical staff, barriers are often linked to lower familiarity with funding processes and more limited access to institutional support, such as help with costing, partnerships, or application development. In this analysis, age is used as a proxy for career stage, although this is an imperfect measure and does not fully capture non-linear or non-academic pathways. Changes to funding call design that explicitly encouraged applications from early-career researchers were associated with a shift in the age profile of applicants. In the most recent XR Labs call, the proportion of applicants aged 30–39 increased from 23.6% to 31.8%, making this the largest age group, whereas previous calls had been dominated by those aged 40–49. By contrast, the proportion of applicants aged under 30 increased only marginally, from 5.7% to 6.4%, suggesting more limited engagement from those at the earliest career stages.

At mid-career stages, particularly among those aged 40–49, is where gender inequalities are most pronounced, with 72% of applicants identifying as men and 28% as women within this age band. This stage is often associated with consolidation into more senior roles and increased expectations around leadership. However, these expectations may interact with how work is distributed within organisations. Evidence from the wider literature indicates that women are more likely to take on teaching and service-related responsibilities, and correspondingly have less time available for research-focused activity¹⁷. As research and innovation funding is closely tied to research outputs and time-intensive application processes, this uneven distribution of labour may affect capacity to apply for and compete for funding. Evidence from the screen industries also suggests that working practices can disadvantage those with caring responsibilities, with long working hours and limited flexibility shaping who is able to sustain participation, which also may interact with career stage¹⁸.

¹⁷ Winslow, S., and Davis, S. N. (2016) Gender Inequality Across the Academic Life Course. *Sociology Compass*, 10, 404–416. <https://doi.org/10.1111/soc4.12372>.

¹⁸ Swords et al., 2022

As such, these findings suggest that barriers are not evenly distributed across the career lifecycle. While early-career interventions may support access, mid-career stages represent a critical point at which disparities can become more entrenched, and where targeted interventions may therefore have significant impact.

Which initiatives and interventions, if any, have helped women and people from under-represented groups develop and progress in their tech careers?

XR Network+ implemented a series of changes across the funding lifecycle, spanning call design, advertising, application, review, decision-making, and feedback. These interventions were intended to broaden participation and reduce barriers to entry, particularly for individuals from under-represented groups.

At the advertising stage, there was a focus on encouraging participation from groups less likely to apply for funding by explicitly inviting applications from early-career researchers, technicians, and first-time applicants, alongside the inclusion of a dedicated EDI section within the call guidance. Applicants were also invited to reflect on equitable design within their projects. Although not formally scored, responses were made available to inform reviewer assessment.

Additionally, efforts were made to reduce the burden associated with applying. Application windows were extended to up to eight weeks, and greater flexibility was introduced in project start and end dates. This was to allow applicants more time to arrange support if they needed and to manage other commitments. Application materials were revised to improve accessibility, including the use of screen-reader compatible formats, editable documents, and using Google Forms for submission, which saves progress and means the application doesn't have to be completed in one sitting. Applicants could also request alternative submission formats, such as video, and were offered one-to-one support calls to discuss their proposals.

Changes were also introduced within the review and decision-making process. The reviewer pool was expanded to include a broader range of professional backgrounds and geographic locations, and reviewers were provided with structured guidance and training on assessment processes and unconscious bias. Reviewers were paid for both training and reviewing, recognising the time required, and enabling wider participation. During shortlisting, an independent EDI observer was present to support reflective discussion and monitor decision-making processes.

Finally, steps were taken to increase transparency across the funding process as a whole. This included the introduction of a pre- and post-award process infographic, designed to make the full funding journey clearer to applicants. Reviewer feedback was checked for bias and edited if

necessary before sending to applicants. Work is also ongoing to identify and publish common feedback themes.

Following the XR Labs funding call, we saw some changes in the applicant pool. The most pronounced change was in age profile: the proportion of applicants aged 30–39 increased from 23.6% to 31.8%, making this the largest group, whereas previous calls had been dominated by those aged 40–49. By contrast, the proportion of applicants aged under 30 increased only marginally, from 5.7% to 6.4%, suggesting more limited engagement at the earliest career stages. Changes in gender were more limited, with the proportion of women applicants increasing only slightly, from 30.2% to 31.8%, suggesting that some interventions may have been more effective for career stage than for gender.

There were also changes in patterns of disclosure and applications across other characteristics. For example, the proportion of applicants identifying as LGBTQ+ increased from 7.6% to 15.9%, alongside a reduction in ‘Prefer not to say’ responses (from 18.9% to 12.7%). As the increased percentage of LGBTQ+ participants broadly matches the reduction in non-disclosure, this may reflect increased confidence in providing this information, rather than a substantial change in the applicant pool. Similarly, the proportion of applicants reporting a disability increased from 11.3% to 20.6%, again accompanied by a reduction in non-disclosure (from 15.1% to 11.1%).

Changes in ethnicity were smaller, with small increases in applications from Asian and Asian British (10.4% to 12.7%) and Black and Black British (1.9% to 3.2%) applicants. For social class, there was an increase in applications from working class applicants (14.2% to 20.6%) and first-generation middle class applicants (11.3% to 15.9%), alongside a decrease in those identifying as middle class. However, these patterns varied by funding call, with larger grants continuing to attract a higher proportion of middle class applicants.

As multiple changes were implemented simultaneously, it is not possible to isolate the effects of individual interventions or attribute outcomes to specific aspects of the funding design.

Which initiatives and interventions, if any, have helped women and people from under-represented groups influence decisions or shape emerging technology areas?

Funding for R&D and innovation plays an important role in shaping who is able to influence the direction and development of emerging technology areas. In this context, the composition of both the applicant pool and the group of funded projects affects whose perspectives and approaches are represented in the development of new technologies.

Several changes within the XR Network+ funding process have been implemented with the aim of widening participation from women and under-represented groups. Efforts to broaden participation at the application stage, including encouragement from early-career researchers

and technicians, and reductions in application burden through more accessible documents, greater transparency in the process, and more time given to complete the application, have the potential to bring a wider range of perspectives into funded work. Where this is successful, it can influence not only who is funded, but also who is able to shape the direction and development of emerging technologies.

Changes to the review process were also important. Expanding the reviewer pool to include a broader range of professional backgrounds and geographic locations, alongside the provision of structured guidance and training, supported more consistent and reflective assessment of applications, helping to identify and challenge potential bias. In addition, having an EDI observer during the shortlisting meeting introduced an explicit point of reflection within decision-making discussions, helping to reduce the risk of unconscious bias. At the same time, a portfolio approach is taken to funding, so where scores are close, factors such as career stage, geography, and gender are considered, which in turn shapes the overall composition of funded projects. This can contribute to a more diverse set of individuals and organisations being supported, which in turn affects who is able to contribute to emerging areas of practice.

However, while these mechanisms may influence participation and representation within funded projects, there is currently no mechanism to assess their longer-term effects on leadership or decision-making power of under-represented groups.

Which, if any, initiatives or interventions that have previously been used now feel less effective as the tech sector changes, and what changes or alternatives would you suggest?

The interventions seemed to have limited impact for certain characteristics, particularly in the context of wider imbalances. For example, the interventions, including encouragement, had a limited impact on the age of applicants. While explicitly encouraging applications from early-career researchers and technicians was associated with an increase in applicants aged 30–39, making this the largest group, the median age group continued to be 40–49. At the same time, the proportion of applicants aged under 30 increased only marginally, indicating more limited engagement from those at the earliest career stages. This suggests that targeted messaging may support engagement from specific groups, but does not, on its own, alter the overall distribution of applications.

The proportion of women applicants increased only slightly, from 30.2% to 31.8%, despite an overall increase in the number of applications. This suggests that extending application timelines may have improved general accessibility, but had limited effect on diversity. While longer timeframes can reduce time pressure, this does not necessarily address the specific barriers faced by certain under-represented groups, which may be linked to wider structural

factors such as caring responsibilities in the home and greater service burdens in the workplace.

By contrast, the grant size appears to have a more substantial effect on the gender of who applies. Across XR Network+ calls, women accounted for 42.5% of applicants for smaller awards (£12,500 or less), compared to 22.7% for larger awards (£60,000 or more). The XR Labs Fund, which offered £25,000 awards, sat between these two, with 31.7% of applicants identifying as women. A similar pattern is evident for social class. For funding calls offering £60,000 or more, only 10.6% of applications were submitted by applicants identifying as working class, compared to 20.0% for calls offering £12,500 or less and 20.6% for the XR Labs Fund. This suggests that larger funding calls may introduce higher perceived or actual barriers to entry, particularly for women and working-class applicants, which is consistent with evidence from relevant research¹⁹.

As such, these findings suggest that interventions focused on process improvements alone are unlikely to be sufficient, and that more systemic approaches should be considered. In particular, the relationship between grant size and the distribution of applicants highlights the need to consider how larger funding opportunities are designed and supported. One potential approach is to maintain a range of funding opportunities while setting out clearer pathways into larger grants, so that applicants can build experience and confidence over time. This may be particularly important for women and working-class applicants, who were consistently under-represented in applications to larger awards.

¹⁹ Arbuckle, K., Bethell, E. J., Hawthorn, D. J., Hunt, K., Khera, M., Lewis, Z., Mitchell, J., Nicholl, M. H., & Reynolds, L. A. (2025). Low socioeconomic status is an under-recognised source of challenges in academia. *Journal of Zoology*, 325(4), 267–275. <https://doi.org/10.1111/jzo.13250>