NATIONAL FORUM
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FORUM INSIGHT

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Making group work work; an exploration of mixed gender group work in Irish higher education

This ***Forum Insight*** summarises the background and preliminary findings from the research undertaken by Dr Barry Ryan of TU Dublin as part of his National Forum Teaching and Learning Research Fellowship, concluded in December 2021.

What is your research about?

My research sought to determine if gendered roles or patterns exist within mixed gender groups carrying out structured and informal group-work in Irish higher education, with a particular focus on the Sciences. A key step of the research was to understand these patterns so as to allow a series of considerations for practice to be developed based on key stakeholder input, including the student and staff perspective. The ultimate aim of my research was to develop tangible, actionable and evidenced-based considerations for staff and students to foster a more equitable learning space and to enhance group work across all Irish higher education institutions. Although the focus is on Science-based group work, these considerations will have reach and transferability across institutions and disciplines.

What prompted you to choose this topic for your Fellowship research?

As a research informed educator the initial rationale behind this project was to interrogate and understand rigorously gathered data to explore the accuracy of personal anecdotal evidence of gendered roles and patterns in formal (and informal) group activities in the Sciences. My anecdotal evidence is based on my lived experience, through which I have developed a certain world-view on student engagement and interactions with laboratory based learning and assessment. I have taught undergraduate laboratories for over a decade, across multiple programme levels and in different Irish higher education institutions. Coupled with this experience as a member of academic staff is my prior lived experience as an undergraduate student in an approximately gender balanced class in a Science-based programme. Finally, engaging with initiatives such as Athena Swan at a University level has allowed me to appreciate how the lived experience of others can be different solely based on gender. For me, carrying out this project would allow me to further clarify my world-view, as well as inform and shape others', based on real, as opposed to anecdotal, evidence from a population that had not been researched before.

Why does this topic matter to those who learn, teach and lead across the higher education community?

This project combined two perennially challenging aspects of higher education; groupwork and gender. Both topics have been the subject of extensive and ongoing commentary, research and debate. This project sought to contribute to these conversations by raising the awareness and developing an understanding of the reasons for gendered roles and patterns in mixed gender group-learning. Subsequently, the creation of a suite of considerations to foster equitable and productive group-based learning environments would empower learners, teachers and leaders in Irish higher education and beyond.

Learners

Mixed gender group work is divisive for learners; some excel, many adapt their learning approach to accommodate learning with peers, whilst others find it a confronting learning environment. Considering the central role the learner plays in group-based learning, the student voice was critical to help unpick the experience of group work in Irish higher education settings, leading to actionable considerations that learners can use. These considerations, researched and co-created in partnership, will help all students achieve their personal version of success when engaging with group-based learning.

Teachers

The use of group based learning in higher education is increasing; however, a deep understanding of how best to facilitate mixed gender group-based activities from an Irish context is limited. From a teacher's perspective, the topic of this research underpins teaching practice and the considerations for practice developed within this research will support teaching staff to be more aware of their gendered actions and how they can help create an equitable learning environment for all. The robust evidence presented in this research, synthesised into a suite of considerations, will immediately inform the construction and facilitation of group work in the Sciences. Although the research is situated in Science-based group learning, the recommendations have reach and transferability across all disciplines that use group work.

Leaders

This research project had a strong practical element, underpinned by existing theory and scholarship. It was grounded in the student voice and lived experience of those studying in Irish higher education institutes. Students, as partners, participated and shaped every element of the project. The student partnership approach ensures student authenticity and agency, and can be used to connect leaders to learners.

What do we already know about this topic from previous literature?

There has been an increasing interest in gender in the Sciences over the last decades; this interest is wide-ranging and focusses not only on balancing gender representation in disciplines and positions of leadership, but also seeks to maximise the benefits of mixed gender interactions in terms of innovation, creativity and productivity in complex scientific systems (Charlesworth & Banaji, 2019). Within the Sciences and allied disciplines,

there has been a concerted effort to narrow the gender gap in terms of gender representation. Despite attempts ranging from awareness raising to policy changes, issues remain in the key areas of equity and access, curriculum and pedagogy, the nature and culture of science, and identity which are seen as barriers to a balanced gender representation (Brotman & Moore, 2008).

Focussing on pedagogy in third level settings, gender as differentiator has been explored across the physical and life sciences (Fisher, Thompson & Brookes, 2020a). Approaches to teaching and learning and their interaction with gender have been extensively investigated, with many researchers concluding that academics and educational facilitators should carefully consider their teaching approach from an equity perspective and ensure, as much as possible, that they foster an inclusive learning environment for all genders and none (Aguillon et al., 2020). Indeed, even in gendered-balanced courses, care is needed to ensure that all genders develop a sense of identity as a scientist, as well as a sense of belonging within the Science community (Fisher, Thompson & Brookes, 2020b).

Group work is used extensively in the Sciences, and beyond, as a key element of active learning, as well as an approach to encourage the development of abilities such as collaboration, communication and a sense of social identity and belonging within a discipline (Gillies, 2019). Research into identity development has highlighted that an intersectionality lens is needed to understand more deeply the experience of the student (Gosling, 2017). For example, previous studies have identified how marginalisation of particular genders (she/her primarily), as well as marginalisation based on other social and economic differentiators, result in negative learning experiences through group-based learning and assessment (Beddoes & Panther, 2018).

Group work based assessment can be particularly challenging, for both students and staff. These challenges include how to fairly assess social skill development and the group work process (Davies, 2009). However, group work based assessment can be enhanced if it is carefully designed in terms of reliability, validity and fairness (Forsell et al., 2020). This builds on the ongoing need to support both students and staff to ensure an equitable and enjoyable experience in mixed gender group learning and assessment in the Sciences and beyond (Beddoes & Panther, 2018; Quinn et al., 2020).

For all genders, a positive initial exposure to Science in primary and secondary school is crucial, followed by the transition to a Science specialisation in third level where teaching, learning and assessment are enhanced by appropriate and informed pedagogies. Supporting budding Scientists of all genders along their development journey will help address a 'leaky pipeline' and ensure persistence of all Scientists into a rewarding career (Charlesworth & Banaji, 2019).

How did you go about the research?

This research was carried out using a mixed methods approach comprising quantitative and qualitative data. Quantitative data was collected through an anonymous, and randomly sampled, online survey following a national call executed through social media, Science communities of practice and the Irish Students Union. The inclusion criteria were all undergraduate and taught master students that participated in mixed-gender group work during their studies and consented to their participation. The online survey was created based on the adaption of existing peer-reviewed and published surveys (Davies, 2009; Mason, 2020; Schwarzer & Jerusalem, 1995) with the addition of ten biographic questions to categorise the survey participants (e.g. gender, programme of study etc.) and five open ended questions (related to the effect of remote learning due to Covid 19 on group work and science task identity informed by Gosling, 2018). In total, the online survey comprised 18 closed questions; most closed questions on the survey were self-evaluation Likert scaled questions. Inferential and descriptive statistics were used to understand the quantitative data generated through the closed online survey questions. The survey also included five open ended questions (four of which only Science students completed) permitting a free text response which generated the initial qualitative data set. The qualitative data set was supplemented with five purposefully sampled, in-depth, semi-structured interviews with Science students (Gender Breakdown: 1 He/Him, 6 She/Her) and a single design thinking workshop, again with purposefully sampled staff and students from Science programmes (Gender Breakdown: 3 He/Him, 4 She/Her; 4 Staff, 3 Student). The semi-structured interview protocol was founded on Creswell's (2013) semi-structured interview protocol and based on a fully informed, participant consented and overt interviewing. The design thinking workshop was based interaction and discussion within a group around a set of topics supplied by the researcher towards the co-creation of a targeted output (considerations for practice in this case). Data analysis was conducted as per the data type; qualitative data were subject to thematic analysis using NVivo and themes were generated by the researcher through interpretative engagement with all qualitative data. Quantitative data were examined through both descriptive statistics, using Microsoft Excel and statistical inference, using R and RStudio (RStudio Team, 2021) to conduct Chi-squared tests of independence.

What are the key initial findings from the research?

The research was broken into three separate, sequential, but interrelated, phases (online survey, interviews and workshop) each generating a rich and diverse data set. The key initial findings are presented here.

The online survey was completed by 118 Non-Science students (Gender Breakdown: 34 He/Him, 75 She/Her 9, They/Them) and 50 Science students (Gender Breakdown: 15 He/Him, 33 She/Her, 2 They/Them). The initial section of the survey documented participant biographical data, with the vast majority of participants undertaking a Science honours degree programme (70%, n=35) in a university setting (68%, n= 34). The respondents were spread across all years (Year 1: 28%, n=14; Year 2: 26%, n=13, Year 3: 24%, n=12 and Year 4: 20%, n=10) and were almost entirely full-time, on-campus students (98%, n=49). These trends in biographic data were also reflected in the Non-Science participants (n=118).

Overall, group work, as a mode of learning, was perceived as being much better than group work as a mode of assessment; a trend across both Science and Non-Science participants. Non-Science (60%, n=70) and Science (56%, n=28) cited group

work for learning as an 'above average' or 'excellent' approach; however, Non-Science (46%, n=54) and Science (56%, n=28) referred to group-based assessment as a 'below average' or 'poor' approach. Self-reported responses to the closed survey questions yielded five questions where a statistical difference between the genders was noted, as determined by multiple chi squared tests, relating to self-efficacy and group work related function, problem solving and analysis (but not group work leadership or output).

This qualitative data set was analysed by thematic analysis driven by researcher interpretation of the data, with view to understanding what characterises and influences roles and patterns in mixed gender group. This interpretivist analysis converged on four major themes (Roles, Skills, Mixed Gender Group Work and Gendered Patterns), and 14 sub-themes (between five and two for each of the four major themes).

What, if anything surprised you in this research?

Overall, the level of perceived gendered patterns or differences in gender self-reported efficacy and skill, in group-based learning was surprising low. Analysis of the qualitative data suggested that gendered patterns are not perceived as being a big issue for students, independent of their gender. Collectively, learners found group-based learning beneficial, but struggled with group-based assessment. Here, personality and ability, not gender, were noted as the biggest challenges to an effective and positive assessment experience. All genders were seen to have similar self-reported strengths and weaknesses in group-based learning and assessment environments, with identifiable patterns related to specific skills, rather than individual gendered roles, emerging. These trends were replicated in both the Non-Science and Science students. This suggests that a wide-reaching, gender neutral, approach to supporting learners in all aspects of group-based learning and assessment will benefit the learner, the teacher and the leader in Irish higher education.

What do your initial findings mean for higher education policy/practice?

This research provides, for the first time, a detailed exploration of gendered roles in group work within a purposefully selected cohort of Science students, indicative of the Science sub-disciplines and Irish institutional settings, synthesised into a suite of considerations for practice. Additionally, a wider student base, from Non-Science programmes also informed the general perception of self-reported self-efficacy and general group work roles, and provided a comparison population to contrast the findings from the Science-based student experience of mixed gender group work, whilst maintaining the Irish higher education context. As such these considerations for practice, constructed primarily through Science based-student and staff partnerships, are applicable to all disciplines and will impact both policy and practice in Irish higher education and beyond. Some impacts, framed by the National Forum Embedding Student Success Framework, are expanded below.

Enabling Institutional Capabilities

Evidence-based decision making

This research provides a snap-shot of the lived experience of learners in Irish higher education institutes as they engage with group work. Initial data analysis suggests that learners enjoy group-based learning, but that they find group-based assessment more challenging. The challenges are not related to gender issues in mixed gender groups; instead they are linked to personality traits and skill levels of the group members. The evidence presented here suggests that group-based assessment should be carefully considered as part of an integrated learning and assessment strategy, and strategic support provided for students before, during and after the group-based assessment.

Structured and well-resourced professional development

Gender can be a challenging theme in Higher Education; however, increasingly staff are offered training to support their personal development in a more gender balanced work environment. Initiatives such as Athena Swan help raise awareness and develop a more gender equal culture. Translating personal development and awareness initiatives into teaching and learning practice requires additional support. The tangible considerations for practice, based on rigorous research and scholarship, that are contextualised to the Irish Higher Education, can help fill this void within sector and could be easily integrated into existing continuing professional development. The effect of staff development in this area will be further strengthened if students are provide with complementary support to refine their skills and efficacy in group work situations to enhance their overall learning experience.

Enabling Institutional Culture

Respectful and meaningful relationships

Unconscious bias can be perpetuated if group work is presented and conducted in a way that reinforces constructs of traditional masculine and feminine roles. It is everyone's role to be respectful of all learners, teachers and leaders so as to avoid propagating stereotypical gendered roles and to avoid learners reconciling doing Science with doing gender specific roles/ tasks in Science. These stereotypes can influence who can and can't do Science and, therefore, who can and can't succeed in Science.

Enabling Institutional Practices

Assessment and feedback

All learners, independent of gender, felt group work for learning was better than group work for assessment. However, embedding an assessment OF/FOR/AS learning philosophy, along with targeted support for learners before, during and after group work, will assist in students developing deep discipline knowledge and appropriate interpersonal skills. Key areas for support identified in this research include helping students deal with conflict in group learning environments, articulating group work output and coordinating the group's resources. Focussing on developing transferable skills of agility, resilience and adaptability will further empower students in mixed gender group work and beyond.

Engagement and student partnership

Student partnership was a core value of this project; students were the priority partner in this research. This evolving partnership took the form of consultation and design during the initial piloting of the research instruments, through active participation in the surveys, interviews and focus groups, to negotiated and discussed final considerations for practice. Embedding the student voice throughout the project, from initial informing of the research question onwards, point to meaningful

partnership. This partnership can be maintained and nurtured in addressing the research question to ensure the outputs are authentic and appropriate to empower students learning in mixed gender groups in the Sciences and beyond.

At a national policy level, this research has highlighted some key enabling recommendations for ongoing and future sector wide research and scholarship.

National Communities of Practice

Existing national communities of practice and networks, such as the SURE Network (Science Undergraduate Research Experience Network), were pivotal in reaching a wide, diverse research population. This community approach to participant recruitment broadened the expression of interest base and allowed for a purposefully selected population from across the Irish higher education landscape to be used. Through supporting the establishment of such networks and communities, the National Forum have provided a rich resource to assist with whole of sector research projects. Maintaining this support, and growing it into areas with limited or no communities of practice, will enable similar research to be conducted into other disciplines.

National Ethics Approval Recognition and Harmonisation

The research described here would not be possible without research ethics approval; however, a centralised and harmonised approach to ethics approval would significantly enhance and expedite whole-of-sector research into the future. A mutual recognition system for cross institutional ethics approval would reduce replication of ethics applications, whilst maintaining a high standard of ethical rigour. Similarly, a harmonised approach to accessing student populations, key in research with students as partners, would allow for increased student participation in research where their voice is key.

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For more information on this research please contact Dr Barry Ryan at barry.ryan@tudublin.ie

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