



D1.1 Gender Action Plan

BioBeo

Innovative Education for the BioEconomy



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Abbreviations

UDL: Universal Design for Learning

GAP: Gender Action Plan

STEM: Science, Technology, Engineering and Mathematics

STEAM: STEM plus Arts

SC: Steering Committee

Executive Summary

The overall aim of BioBeo is to develop and deploy an education programme that will enhance understanding and engagement across society regarding ‘circularity’ and the bioeconomy, using five bioeconomy themes – interconnectedness, outdoor learning, forestry, life below water, and the food loop. A sustainable network of interconnected European educators and stakeholders committed to promoting the bioeconomy concept through all channels will co-create and co-deliver the education programme. BioBeo will provide the means for better coordination between bio-science and education in schools by developing the Circular Economy Science-Society message. It will have a particular focus on circular lifestyle, circular behaviours, and a governance framework on society-wide engagement in bioeconomy policy. BioBeo shall take steps to address social issues such as gender bias, disadvantaged youth groups, migrants and members of society with additional needs.

BioBeo targets increased gender equity through specific education activities. Awareness of all genders as participatory stakeholders in the bioeconomy conversation is of crucial importance.

As part of this effort, BioBeo will roll out initiatives intended to inspire future citizens in STE(A)M careers in the bioeconomy, with a focus on gender balance as well as those from ethnic minorities and disadvantaged backgrounds. Societal barriers such as gender stereotyping and socioeconomic issues may reduce the opportunity for sustainability in the future. Thus, the Gender Action Plan (GAP) serves as an essential starting point for inclusive, universal design.

By providing boys and girls with equal access to all its activities, BioBeo supports the concept that attracting and retaining a more diverse workforce will maximise innovation, creativity and performance. Our approach to replacing the competitive-type classroom environment by teaching and learning sequences emphasises talk and discussion, sharing of ideas and collaborative analysis of data, involving local professionals and university students. Through inviting local and national professionals working in the bioeconomy industry, they will demonstrate future career opportunities in STEM regardless of gender, while simultaneously breaking down stereotypes that young boys and girls may hold about STEM careers.

The GAP provides an overview of the state of art in gender balance in the European Union with special focus on the countries participating at BioBeo, and offers a framework for BioBeo to deliver on the above promises.

The educational institutions and research organisations partners in the BioBeo consortium already have their own individual GAPs as required by Horizon Europe. This GAP embraces their individual GAPs and commits all partners to the principles of best practice in terms gender equality and also the integration of the gender dimension into research and teaching content. The consortium has appointed Eszter Salamon PhD (IPA) as gender action officer for BioBeo who is the primary author of the GAP. She will monitor adherence to the GAP reporting to the Project Co-ordinator and the Steering Committee. Partners will report any issues arising to her.

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Introduction

BioBeo targets increased gender equity through specific education activities. Awareness of all genders as participatory stakeholders in the bioeconomy conversation is of crucial importance.

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The GAP is the road map for gender activities in BioBeo providing an overview of the state of art in gender equality in the European Union with specific focus on the countries represented in the project, and offers a framework for BioBeo to deliver on the above promises.

The first element of the GAP is a gender analysis including a gender impact assessment. This forms the basis for the second part of the GAP that guides future deliverables on being gender-responsive and inclusive. As the main focus is on future bio-economy related STEM carriers, the GAP builds on evidence from relevant STEM/STEAM projects. The core of the solutions offered are based on BioBeo's Universal Design for Learning UDL approach.

1. Assessment of the gender equality challenges

1.1 Consortium level

The BioBeo consortium is at its start well gender -balanced.

1.1.1 Governance

The consortium is governed by two main bodies, the Steering Committee where main project-related decisions are officially made, and the meeting of the Work Package leaders to take forward practical work and monitor progress. Their work is also supported by an Advisory Board.

The Steering Group as well as the Work Package Leaders' team is gender-balanced with both male and female representatives. Although, the consortium is not forcing anybody to declare their gender, the previous statement is based on the declarations of those who did declare it.

Since Work Package 2 considers innovative governance structures, it is of utmost importance that the consortium itself implements structures that cover gender issues.

1.1.2 Work-life balance

A crucial aspect of gender equality is work-life balance. The consortium has already implemented internal measures as follows:

- Meeting dates and times are chosen well in advance and using iteration tools (e.g. Doodle).
- Reports are provided for those who cannot participate and, if necessary, individual meetings are provided to engage them.
- In-person meetings are timed so that they do not strain family schedules much.
- Deadlines are set to ensure that people are not forced to work outside of their regular working hours.
- Mostly remote activities allow for people to set their own working hours as it fits them best.
- Online meetings take place in time slots that are working hours for most – taking into consideration that the consortium is working across 3 European time zones.

1.1.3 Career development

During the project's implementation period, partners are offering possibilities for career development (e.g. in the form of engaging university students and younger professionals in their work). As nearly all partners are research institutions, they are acting in line with their internal gender equality plans in this field. The implementation of the project offers career development opportunities, especially through gaining specialist and in-demand knowledge, regardless of the gender of participating team members.

1.1.4 Research and curriculum

Gender equality plays an important part in BioBeo, and is therefore an element taken into consideration in planning the research and curriculum development/experimentation undertaken.

Teacher training

According to Education at a Glance 2022 by the OECD, female teachers are over-represented in the professional education workforce. In all consortium countries, the ratio of female teachers is over 70% with the highest percentage of male primary teachers in Greece and the lowest in Austria. Among the 10 countries represented in the consortium, the situation in secondary schools is the most imbalanced in Estonia, and

closest to balanced (about 54-46) in the Netherlands. The reasons are analysed in-depth by an OECD report “Why is the gender ratio of teachers imbalanced?”. Their analysis quotes gender stereotypes around the profession with teaching being considered a female profession, the work arrangements being attractive to working mothers as well as the salary levels reflecting the gender pay gap.

Similar imbalances are already present in teacher education with the overwhelming majority of pre-service teachers being female. A 2015 study among 15-year-old students carried out during the PISA cycle revealed that these gender inequalities are already present in the career plans at this age with a very low percentage of boys being attracted to teaching professions.

What makes the case even more complex is that according to an in-depth study from 2018 “The Gender-Equality Paradox in Science, Technology, Engineering, and Mathematics Education” by Stoet, G. (Psychological Science Volume 29 Issue 4), the higher the gender equality level in a country is, the more likely women are to choose professions that are traditionally female professions. The more empowered women are, the fewer of them choose STEM careers. At the same time, there are major differences within the EU with most former socialist countries showing much higher girl participation rates in STEM.

The most recent – 2021 – SHE data by the European Commission shows that on Bachelor’s and Master’s level in the EU 53% of graduates are female and that there is a balance on PhD level in most countries.

Some ethnic and cultural groups are clearly under-represented in pre-service teacher education that leads to an ethnic and cultural imbalance in the teaching professions, but there is no evidence showing that there is any difference in gender ratios in these groups.

1.2 School students

By the nature of compulsory education and since in the EU enrolment in formal education is close to 100%, there is a near total gender balance in the first levels of education (the slight difference is in line with demographic realities). However, even at pre-school level, professional educators should be aware of and alert about gender bias often present in education by family, community, but also formal settings from early years. It is unconsciously present even in adults who consider themselves unbiased (a well-known experiment promoted by BBC is well known).

Certain ethnic and cultural groups show a clear gender bias not supporting female children in pursuing higher levels of education. These groups are generally under-represented in academic secondary education and higher education. At the same time, there is no research data on female children from these groups being more under-represented than their male counterparts.

In international measurements, girls and boys do not show a significant gap in science (there are country variations, but the gap is not significant anywhere in Europe), but girls way outperform boys in IT skills while underperform somewhat in maths in most countries. However, there is a significant outperformance of girls in reading that has an impact on further education, too.

In secondary schools, the situation is highly impacted by performance before the primary to secondary transition. Research shows that children lose interest in science far too early (age 11–15 the latest), but as girls are more resilient when it comes to “boring” things, they outperform boys. This is the reason why they are so

much overrepresented in academic secondary education. For this the available data can be obtained by checking the gap in VET in favour of boys and checking the percentage of children in various countries in VET as compared to academic secondary education. It is difficult to compare, because in some countries there is very early stranding (e.g. in the Netherland) while in others the path is the same up until the age of 16 and the VET/academic stranding is only from that age. However, it is a good indicator that the European Institute for Gender Equality reports that only 13% of VET graduates are female. At the same time, the professions VET schools train for are overwhelmingly STEM ones.

The approach to gender equality is made more complex by the EU's policies promoting inclusive approaches towards all genders, not only male and female, and the policies that imply gender to be a choice based on declaration that makes research on the topic difficult and requires gender action planning to implement a gender-neutral or gender-universal approach.

2. BioBeo's general answer is UDL

Universal Design for Learning (UDL) is the best answer to the complex challenges described in the assessment. It clearly and intentionally addresses various inclusion aspects, including gender, by being an educational framework that approaches learning and teaching in a way that gives all children – and all members of learning communities – equal opportunities to learn, develop and succeed. The goal of UDL is to promote flexibility and diversity in the curriculum and classroom practices, by establishing three principles:

- Multiple means of engagement to tap into learners' interests, challenge them appropriately, and motivate them to learn (for example, suggest activities that are culturally or socially relevant to students, vary duration and sequence of the activities, and give students the possibility to make choices)
- Multiple means of representation to give learners various ways of acquiring information and knowledge (for example, share information in different formats – visual, auditory, tactile, kinaesthetic)
- Multiple means of expression to provide learners alternative forms for expressing and demonstrating what they know (for example, alternatives for using pen and/or pencil, giving an oral report, making a video, doing a group project)

The implementation of classroom practices based on the UDL implies a flexible and personalized approach by teachers, in the way they involve and motivate students in learning situations, present information and operationalize students' evaluation. Considering the diversity of students in the classroom and that each student learns in a unique way, only applying an intentional, proactive, and flexible curricular approach and offering accessible, diverse, and differentiated learning methods, materials, and resources makes sense and can benefit all.

Many schools and communities are creating inclusive and learning-friendly environments. However, there are no quick solutions or a one-size-fits-all formula. It is really a self-discovery process, where one is always learning, discovering new ways of promoting the participation of all children in every context, sharing ideas, strategies, and resources. Creating strong and solid partnerships with families, teachers, school, and community organizations, whilst seeking support and accountability from policymakers, will help to facilitate the process and to overcome eventual challenges that may arise along the way.

The benefits of inclusion are numerous and include not only the learners enrolled in formal education, but also their families, teachers, school, other professionals, and communities. An inclusive society, where all can actively participate and contribute (in their own way and according to their unique abilities and competences), is a more conscious, aware, respectful, efficient, harmonious, and just society.

Introducing the "A" in STEM, and promoting STEAM solutions that include arts in STEM activities, including bioeconomy, is part of the UDL efforts.

3. Specific gender action points for BioBeo implementation

Societal barriers such as gender stereotyping and socioeconomic issues – often closely related to the former – may reduce the opportunity for sustainability in the future. Being keenly aware of this, the BioBeo consortium intends an inclusivity policy in its practices as well as design and to promote similar practices in its main targets: schools – teachers, school leaders and schools as complex institutions -, teacher training, youth groups, parents and communities.

BioBeo, focusing on circular lifestyle, circular behaviours, and a governance framework on society-wide engagement in bioeconomy policy, pledges to take steps to address social issues such as gender bias, disadvantaged youth groups, migrants and members of society with additional needs. Gender inequalities may also go hand-in-hand with the other challenges, and thus need a consistent and constant emphasis. BioBeo is intended to go beyond the formative year and to inspire future citizens in STEM careers in the bioeconomy, with a focus on gender balance as well as those from ethnic minorities and disadvantaged backgrounds – often also impacted by gender balance more than other groups.

Through inviting local and national professionals working in the bioeconomy industry, BioBeo partners will demonstrate future career opportunities in STEM regardless of gender, while simultaneously breaking down stereotypes that young boys and girls as well as non-binary students may hold about STEM careers. The phrase “If you can’t see it, you can’t be it” could be used as a hook to invite partners from industry to support the educational programme.

Gender Action Points			
Task	Objective	Measure of success	Responsible
1.1 Management of the consortium	Gender-balance in management bodies	Keeping the balance without gender balance prevailing professional prerequisites	UCD
1.2 Financial management	Gender balance in participants of financial management	Keeping the balance without gender balance prevailing professional prerequisites	UCD
1.3: Communication with EC	Gender-balanced representation of the consortium	Keeping the balance without gender balance prevailing professional prerequisites	UCD
1.4 Intra-consortium communication	Gender-balance in the project teams	Keeping the balance without gender balance prevailing professional prerequisites	UCD
1.5 Gender Action Plan	Gender-balance in action planning, revision and implementation	Keeping the balance without gender balance prevailing professional prerequisites	IPA
1.6 Risk management	Avoiding all gender-related risks and mitigating ones arising	Keeping the balance without gender balance prevailing professional prerequisites	UCD

1.7 Data management	Gender-balance in the project teams	Keeping the balance without gender balance prevailing professional prerequisites	UCD
1.8 IPR management	Gender-balance in the project teams	Keeping the balance without gender balance prevailing professional prerequisites	UCD
2.1 Institutional barriers & opportunities	Focus on gender-related barriers and opportunities	Section on gender-related findings	CASE
2.2 Structures and networks	Evaluation of structures and networks from a gender-equality perspective	Section on gender-related findings	CASE
2.3 Engagement of youth in policy making	Exploring and addressing potential gender inequalities in youth engagement	Uncovering gender equalities (or proving they do not exist). Proposing universal solutions	YSBF
2.4 Engaging parents in policy making & governance	Exploring and addressing potential gender inequalities in the engagement of mothers and fathers as well as parents in non-traditional family settings	Uncovering gender equalities (or proving they do not exist). Proposing universal solutions	IPA
2.5 Framework for innovative governance	Delivering an enabling framework for all genders	Universal design solution in the framework addressing the gender topic	CASE
3.1 Youth Education Programmes	Delivering an inclusive programme based on UDL Addressing the disadvantages of boys in formal education	The programme highlights the gender aspects for attention	MU
3.2 Development of Digital Toolkits	Delivering tools that are gender-neutral, promote gender equality and equal participation in using them	Gender equality and gender neutrality is identified as a quality measure	YSBF
3.3 Interconnectedness	Engagement of policy makers and youth in a gender-balanced way	Measures included in deliverables for gender equality without gender balance prevailing professional prerequisites	UH
3.4 Annual European BioBeo Festival	Considering gender balance both in organising bodies and among participants	No significant gender bias towards any gender	RUAS &OUAS

3.5 Teacher Education	Developing programmes that are attractive for male students Gender tackled in a balanced way to prepare teachers for the inclusion of both boys and girls	Higher intake of male students Gender-related training unit showing the balanced approach to gender challenges	MU
3.6 STEM Career Development	Clear promotion to STEM careers to all genders with focus on both vocational and academic trainings as a basis	Universal design promoting STEM careers to all regardless of gender identity	E3STEM
3.7 Evaluation	Evaluating the gender-balance impact of measures	Evaluation including gender data	MU
4.1 Dissemination & Communication Plan	Gender balance in communication	Balanced participation in planning and communication teams in general	SYNYO
4.2 Dissemination & Structured Dialogue	Target and reach regardless of gender, and those who can influence gender-impacted decisions	Universal design in message creation, outreach and target groups	SYNYO
4.3 Communication Tools & Media Outreach	Promoting bioeconomy and STEM Careers for all	Tools for promoting bioeconomy and STEM careers regardless of gender	SYNYO
4.4 Exploitation Plan	Target and reach regardless of gender, and those who can influence gender-impacted decisions	Exploitation activities specifically addressing the complex gender situation in Europe and beyond	UCD

Table 1. Gender Action Points

Lead responsibilities are according to the overall workplan of BioBeo.

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