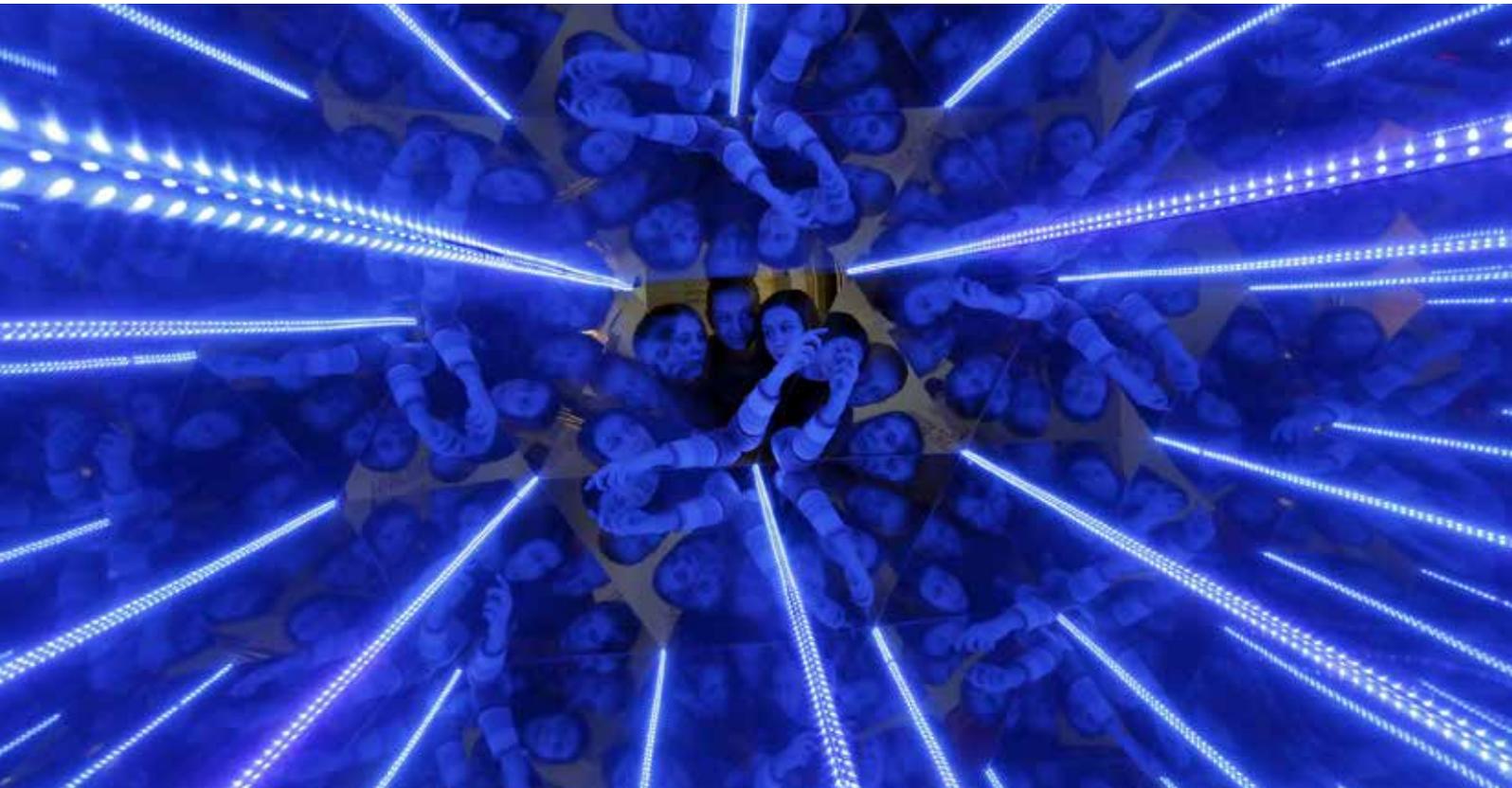


Handbook on how to make Science, Technology, Engineering and Mathematics (STEM) more appealing to girls and young women

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Foreword

A large number of Nordic youths complete long-cycle higher education, which is important to Nordic countries because their earning power going forward will depend on knowledge. However – by contrast with widespread perceptions – the percentage of students who choose Science, Technology, Engineering and Mathematics (STEM) has stagnated.¹

The gender-segregated choice of study programme and the gender-segregated labour market resulting from this pose a common challenge to the Nordic countries, which are lagging behind in terms of attracting young women to STEM.² In the light of this, the Council of Ministers for Gender Equality (MR-JÄM) has wished to focus on the challenges of recruiting women for these subjects and retaining them in their studies.

This handbook presents good examples of how players in the educational sector, including politicians, student counsellors and educational institutions, can work to break down the gender-segre-

gated choice of study programme. The purpose of this handbook is to provide a tool which can help identify specific problem areas and implement solutions to resolve them. For this reason, the handbook is divided into sections focusing on what can be done by practitioners in businesses, institutions of higher learning and primary schools to increase the percentage of women within STEM, but the handbook can also be read in its entirety.

The handbook evolved from a major project, which resulted in the report *Piger i STEM – kortlægning af udfordringer inden for køn, ligestilling og uddannelse i Norden* [Girls and Young Women who choose STEM – a survey of the challenges relating to gender, equal rights and education in Scandinavia] and the handbook's recommendations conform to the report's conclusions. Thus, the handbook's basic documentation can be found in the report.

We hope you enjoy your reading!
DAMVAD Analytics



Sebastian Willnow

Introduction

DAMVAD Analytics has prepared the report *Piger i STEM – kortlægning af udfordringer inden for køn, ligestilling og uddannelse i Norden* [Girls and Young Women who choose STEM – a survey of the challenges relating to gender, equal rights and education in Scandinavia] which shows the trend in gender-specific choice of study programmes. The report shows that there is a vast difference in which study programmes are chosen by girls and boys respectively. It is generally true that more men than women choose to study STEM subjects. For the Nordic countries as a whole, this has not changed over the past five or ten years. In other words, the trend in this area appears to have levelled off.

There is a vast difference in the trends within the different life science subjects. In subjects such as biology, biochemistry and environmental science, women comprise the majority, whereas in physics, mathematics, computing and engineering, women are generally under-represented. We have identified the following explanations of why this is so:

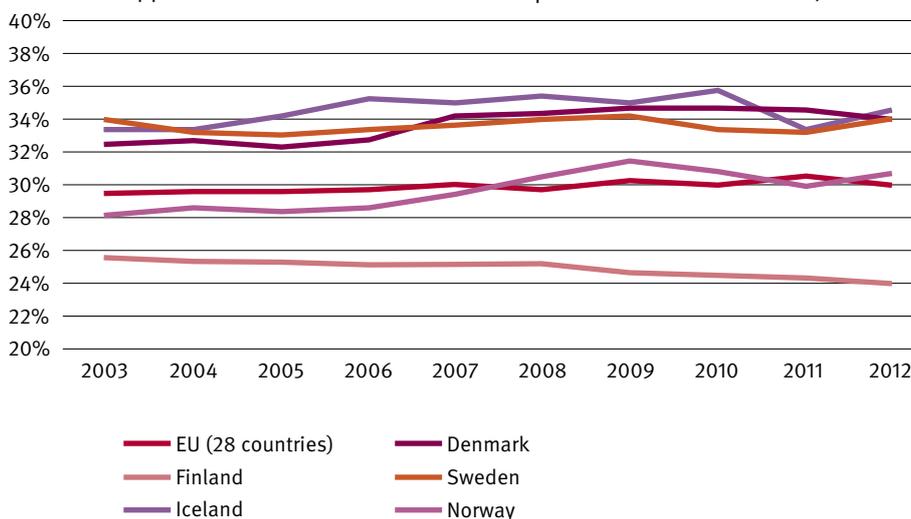
Confidence in one's own abilities

There is a difference in the extent to which young men and women have confidence in whether they can do well in science and technology subjects. As young students' interests are often influenced by how they perceive their own abilities, much

of the reason for the gender-segregated choice of study programme is found in this perception. Teachers, educators, parents, etc., must be aware of this in order to change this situation.

Teacher expectations and encouragement

There is much to indicate that teachers expect "proper" boys and "proper" girls to be interested in and good at different things, i.e. that boys are expected to be adept at and interested in science subjects whereas girls are expected to best at and take greatest interest in linguistic subjects. According to girls' own perceptions, one reason they chose a different study path is that



Trend in the percentage of women studying STEM in general
Source: Eurostat

Note: As in previous international comparisons, the STEM subjects comprise ISCED levels 5a, 5b and 6, i.e. higher education programmes. At aggregate level, the overview comprises the following sub-groups: Engineering, Manufacturing and Construction, Life Sciences, Physical Sciences, Computing and Mathematics, and Statistics.

their teachers did not encourage them to study science subjects. This is expressed as part of the student counselling process, where girls in particular state that they would have preferred to receive better guidance about STEM subjects.

Parental attitudes

In general, parents exert great influence on their children's educational choices, but the results of the interviews indicate that the specific study direction was not discussed in homes where women had not chosen to study STEM subjects. Girls who do choose STEM, on the other hand, show an obvious tendency to have been strongly influenced by their parents' – especially their father's – attitudes in choosing their path of study. In many interviews, women who did choose to study STEM subjects reported that their father had a STEM profession and that this had a significant influence on the choice of education.

This is in line with other academic research results from the Nordic countries and abroad. Swedish research shows that students' educational choices are dependent to a great extent on the educational level of their parents. But other studies find this as well.

We find that there are few initiatives directed towards changing the attitudes and behaviours of parents.

Societal reinforcement of gender roles and expectations

Generally speaking, these factors mean that society as a whole is sluggish in terms of getting young women to choose STEM as their higher education. In addition, the norms for and expectations of women and men are often reinforced in media, advertisements, computer games, etc.

The project charted and analysed a wide range of the initiatives launched across the Nordic countries in attempts to alter gender disparity relating to the choice of study programme. Many of the completed initiatives include elements that can be used in efforts going forward. Taking a holistic approach to the problem areas relating to gender equality within education is crucial, and for this reason the handbook is aimed at several different players. Politicians in the Nordic countries can help to ensure a broad-based effort, but in order to achieve the desired results, the efforts must be embedded among practitioners such as teachers, businesses, parents, student counsellors and professional organisations.

The good examples and future-oriented perspectives presented in the following focus on heightening the appeal of STEM to women. It is our hope that the handbook can be a tool both for working specifically on recruitment and retaining young women within STEM and

for heightening the awareness of various players as to how norms and stereotypical outlooks on gender, education and the labour market work to inhibit personal development.

Methodology

These results are based on a study conducted by DAMVAD Analytics from February to December 2015. STEM covers five areas: Life science, physical science, mathematics & statistics, computer science & engineering, manufacturing and construction

The study is based on five different sources of data.

- A quantitative analysis based on data from Eurostat, covering the period 2003–2012, and data from the Nordic national statistical offices covering 2004–2014.
- A literature study.
- Five surveys to students at secondary education level and higher education institutions in the five Nordic countries. There was 400 respondents in Norway, Denmark, Sweden and Finland and 200 respondents in Iceland.
- Focus groups and interviews with students in all five countries and Greenland, The Faeroe Islands and The Åland Islands.
- A mapping of gender equality initiatives with involvement of researchers in the Nordic countries.

Business efforts

Why are businesses important players?

In the recruitment process, businesses benefit from having access to a resource base which is as broad as possible; they basically need access to talent and experience. Therefore, it can be challenging to businesses if they cannot recruit women with a STEM-based education.

At the same time, businesses have a part to play in terms of getting more women to choose STEM because the businesses 1) can help to emphasise the importance of a more equal choice of study programme from a growth perspective; 2) can offer to partner with educational institutions; 3) can provide role models; and 4) will employ the graduates upon completion of their education.

Role models are crucial: women in particular appear more motivated to choose a science or technology education when inspired by other women from these study programmes or sectors.

What can businesses do?

Businesses can launch a wide range of initiatives which help to break down the gender-segregated choice of study programme. Here are some examples:

1. Networking with other businesses

Businesses can network with other businesses – possibly within sector organisations – to create keener focus on getting more women to choose STEM disciplines.

A specific measure that can work well in this type of network is for businesses to draft a policy for gender equality and set goals for its achievement. This could be done, for example, by drafting an equality charter which can be mutually binding for the businesses. A charter has

no effect by itself – it does not become effective until it is observed. This can be ensured by businesses monitoring this process and, for instance, preparing overviews and evaluations of their specific initiatives. This gives the individual business cause for considering how to achieve the goals. At the same time, it makes it possible for businesses to learn from one another's experiences.

2. Focusing recruitment efforts

The businesses can work to set targets for the percentage of women they wish to employ within various professions and develop methods for achieving them. This involves striking a better balance in hiring procedures and appealing to women applicants, e.g. through the wording used in job ads and employment procedures. For instance, it is possible to prioritise teamwork and collaboration, because many women express how making a social difference through their work is important to them. The results of the TechEq network and other initiatives show that it is possible to change the recruitment composition by becoming aware of and focusing on it.

CASE STUDY

The equality initiative TechEq network

In 2014, the equality initiative TechEq³ was formed in Sweden by four major IT companies to increase the percentage of women, particularly within IT and technology sectors. Since then, more than 70 businesses have joined the network and signed the “TechEq Agreement” which is binding. After the first year, a pamphlet of specific initiatives implemented by the businesses was published.

3. Developing role models

Developing role models at a number of levels is emphasised by researchers and practitioners as essential for changing common perceptions of which gender chooses specific study programmes and therefore holds specific jobs.

It is important that the role models do not seem unattainable, highly skilled or perfect; they must be individuals with whom women can realistically identify. Therefore, it can be a good idea to seek to remove the impression that STEM disciplines are only for individuals with unique technical talents. Instead,

the focus should be on presenting a wide range of different career paths and a wide array of role models.

Experience shows that women who would otherwise be attracted to science can be discouraged if they are only presented with successful career women.

over, it is important to be aware that role models are not enough by themselves. Although role models are important, research shows that they cannot stand alone. There is a need for a more holistic strategy targeting all players. But it is also important to consider how to plan the teaching of STEM subjects (see sections 4 and 5).

4. Set up personal meetings between students in the process of choosing or enrolled in study programmes or employees within STEM disciplines.

Personal meetings between students in the process of choosing or enrolled in STEM programmes or persons employed within these disciplines can help girls and young women to form an accurate impression of who is involved in STEM and an idea of their everyday studies or work.

These contacts can possibly be established as part of networking meetings between businesses and women students where the topic is technology study programmes and STEM's image, for the purpose of recruiting more women for scientific studies and jobs. This can take place as part of higher education

CASE STUDY

Jet-net.dk – school–business collaboration

In Jet-net.dk,⁴ Danish businesses are involved in a school–business collaboration that brings students and businesses together on science and technology. The purpose of the network is to create more application-specific teaching and give students insight into the businesses' activities, as well as provide knowledge about their job options. The network focuses on both primary school and institutions providing secondary education. The network is coordinated by the House of Natural Sciences, and each year a "Girls' Day in Science" is held where businesses all over Denmark open their doors to primary and upper-secondary girls and give them an opportunity to work on practical assignments. At the same time, the girls encounter women employees who can help inspire them and get them to see new possibilities in the field.

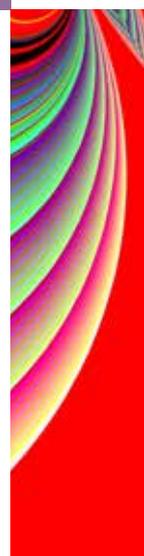
CASE STUDY

Role-model database

A relevant Norwegian example of a wide array of role models is www.rollemodell.no, a role-model database where students can get an idea of different career paths and where school classes can request visits by role models. The initiative focuses on engineering and technology and was initiated by the Norwegian Ministry of Education and Research and the National Centre for Recruitment for Scientific Subjects. This is one of several initiatives aimed at increasing interest in the sciences and thus getting more students to choose fields of study focused on science and technology.

but also on youth study programmes and possibly in the primary-school area, because this is where interest in STEM is stimulated and choices are made.

Businesses can also collaborate with institutions of higher education as part of the institutions' efforts to recruit women for subjects where women are under-represented. This could be done, for instance, by the educational institutions inviting role models from businesses to take part in recruitment events or by organising mentoring processes.



Efforts by institutions of higher education

Why are institutions of higher education important players?

Institutions of higher education play a crucial role in terms of both recruitment for and retention of women students in STEM subjects. Girls need to be made aware of the study environment and areas of study provided by these educational institutions and find them motivating and appealing – both before and during the study programme.

What can institutions of higher education do?

Institutions of higher education can launch a wide range of initiatives that can help to dissipate gender-segregated educational choices. Here are some examples:

1. Focus on balancing the gender breakdown to create a different study environment

Institutions of higher education should focus on how having a balanced gender breakdown changes the study environment and is generally appreciated by students. To most students, it is important to study in an environment they can identify with and which appeals to them. As background to the report *Piger i STEM – kortlægning af udfordringer inden for køn, ligestilling*

og uddannelse i Norden, DAMVAD Analytics conducted a survey with a questionnaire for students enrolled in Nordic youth study programmes and higher study programmes. In the questionnaire survey, 64% of girls/women and 66% of boys/men surveyed respond that it is important to fit in with the study programme. For this reason, an increase or decline in the number of women enrolled in a study programme could contribute to increasing or reducing the number of applicants to the programme and increase or reduce the drop-out rate, depending on whether there are other women students enrolled in the programme with whom the women can identify. It is important that this effort by educational institutions be given priority by the institution's management so that it is perceived

as important and embedded within the organisation.

It is probably insufficient if the initiatives implemented are extra-curricular activities only. There is much to indicate that the teaching itself must also be inclusive, e.g. by ensuring that teachers and researchers whom the students encounter reflect gender-based diversity. The teaching should also reflect the multifaceted nature of science and the fact that it can appeal to both women and men. It turns out that many general (not gender-specific) initiatives to improve the STEM image and learning have a good effect on both genders, but perhaps particularly on women, e.g. through the encounter with role models or mentors while studying.

Another example could be to establish a secure learning envi-

CASE STUDY

Focus on gender equality in the strategy of the Norwegian University of Science and Technology (NTNU)

The NTNU strategy articulates, among other things, that NTNU's values cover equality issues in different ways: *We must promote equality and demand tolerance across outlooks on life, culture and gender. We must contribute to diversity and equality in working life and our own activities.*

ronment by focusing on a sense of community rather than encouraging a competitive atmosphere. DAMVAD Analytics' questionnaire survey shows that 42% of girls/women surveyed do not think they are clever enough for this type of (STEM) study programme, while this correspondingly applies to 35% of boys/men. Initiatives focused on the learning environment and community could therefore be particularly beneficial for women. A possible initiative would be to create a learning space that supports different interests as well as different studying and learning strategies.

Overall, Gender Aware Teaching involves avoiding implicit and explicit gender bias in the selection of courses and the teaching itself. New initiatives should be based on candid, free dialogue among teachers, because the initiatives must be embedded in the organisation and be coordinated with practical implementation. This has been a highly prioritised area of focus at Finnish teacher-training institutions. However, the lessons learned in Finland attest to the long, difficult process required for intensifying the focus on gender equality within study programmes and for heightening an awareness of gender issues in schools and among teachers. This is related to factors such as the Nordic self-perception that it is a very egalitarian society.

2. Market the study programmes to a wide target group and provide a nuanced depiction of study life.

Many STEM subjects/disciplines are shrouded in the myth that they are best suited for nerdy boys. This can have a discouraging effect on girls. Therefore, it is important to ensure that recruitment campaigns include a nuanced depiction of study life. In their marketing efforts, educational institutions – those providing long-cycle higher education programmes as well as primary schools and youth study institutions – should realistically depict the gender breakdown on a specific study programme and focus more keenly on providing information about the programme and/or specific careers within STEM.

Marketing and recruitment initiatives should target girls in situations when important choices are being made, where they are actually confronted with whether a science and/or technology study programme is something they are interested in (cf. the questionnaire results described under point 1). This means that educational institutions can benefit from focusing on the following in their marketing of and recruitment initiatives aimed at science and technology subjects:

- The image of the field and the subject area and its societal significance

CASE STUDY

Girls' Day and the Royal Institute's focus on women "giants"

Every year, the Norwegian University of Science of Technology (NTNU) organises "Girls' Day" (Jentedagen) where the university invites girls enrolled in selected programmes at secondary educational institutions to a two-day event. The girls are given an opportunity (free of charge) to learn more about the university and meet prospective fellow students, as NTNU has devised a programme including accommodation, a festive dinner and entertainment where the girls listen to older students' experiences, meet representatives from the business community and hear presentations about transitioning from "nice girls" to "smart women". The girls also encounter the individual study programmes at stands and receive guided tours of the university and campus.

Sweden's Royal Institute of Technology also focuses specifically on the importance of women's participation in technology study programmes. The Institute's website – under information about the study programmes – focuses on women "giants" in the technical sciences who have contributed important discoveries to our society.

- The possibility of creating a community among women within science and IT
- Presentations of and by role models
- Emphasising that the study programmes involve a high level of cooperation.

CASE STUDY

SYST/ERS: group of women computer-science students

At Reykjavik University, women employees of the computer science department met with women students once a week to create a learning space. This subsequently developed into the SYST/ERS group, which is a group of women studying computer science at Reykjavik University. The group is now run solely by students and also organises a number of activities for women students, such as technology workshops or inspirational events featuring women role models.

3. Efforts to retain women students through social activities and networking

One option is to work actively to retain women students. For instance, many educational institutions have been involved in setting up computer rooms especially for women, football teams, and career networks where women can meet businesses and establish networks during their studies. It is important that this effort is not solely based on extracurricular activities.

4. Working on role models and mentoring programmes

There is much to indicate that one reason for women's under-representation in STEM is the scarcity of women role models. This applies both in society in general and at

institutional level. Therefore, it can be important to deliberately work to reduce women's under-representation. In order to reverse this tendency in the long term, it is important to focus on promoting the recruitment of women teachers as well, because they serve as role models in everyday life. The concept of having a gender mix on study programmes can even start when recruiting instructors and graduate-student teachers.

CASE STUDY

Pepp! – a platform and mentoring programme

The Pepp!⁵ initiative, developed by Sweden's technical universities (Royal Institute of Technology and Chalmers University of Technology) provides a platform comprising girls enrolled in upper-secondary schools, university students and businesses. One of the important activities is a formal mentoring programme aimed at girls enrolled in upper-secondary school who "are given an opportunity to talk about all sorts of issues with a personal mentor, a women engineering student from RIT or Chalmers".

5. Creating networks among girls/women at upper-secondary programmes, higher education programmes and businesses.

The educational institutions can develop networks among girls attending upper-secondary programmes, women enrolled in higher education programmes and at businesses. The purpose of the networks could be to inspire one another and gain new insight as well as to disseminate lessons learned from work and study life to prospective students and students enrolled in the programmes. This involves giving top priority to personal encounters as well as ensuring that girls attending upper-secondary schools can establish personal relations with women who are studying engineering and who therefore can provide insight into and perspectives on their studies. At the same time, it is a good way to communicate role models.

6. Collaboration with businesses

There are several instances of educational institutions experiencing great interest from businesses in getting more women into their sector. The advantage of this is that it can help to show women the types of jobs their studies can lead to. Institutions of higher education can thus, to an even greater extent, envisage collaboration and networking with businesses so that they can join forces to create more diversity and variety at the science and technology programmes.

Efforts by primary schools

What makes primary schools important players?

Interests are established early in life, long before an individual has to choose subjects or study programmes at secondary and tertiary educational institutions. This takes place particularly in primary school, as part of acquiring knowledge and skills in various subjects. There is much to indicate that both teachers and parents help to articulate expectations of and norms for girls that draw them away from STEM subjects and do not sufficiently motivate them to choose scientific paths of study – in many instances quite the contrary, in fact.

Therefore, it is important for players at primary-school level, i.e. school management, teachers and student counsellors, to be aware of the gender-segregated choice of study programme. Thus, primary school is a crucial venue for identifying and implementing solutions that can help to break down the gender-segregated choice of study programme.

What can the primary-school sector do?

The various practitioners and players at primary schools can implement various initiatives to break

down gender-segregated educational choices. Here are some examples:

1. Teachers can encourage students to take an interest in different subjects.

Teachers are of crucial importance to students' interests and their subsequent choice of study programme. Generally speaking, teachers are role models for students, which means they have the potential to encourage or discourage students from becoming interested in various subjects. This makes it important to allow space for different interests

in the teaching. Priority should be given to facilitating dialogue about gender, equality and learning.

For instance, efforts could be based on an ambassador approach where networks across schools, the business community, public authorities and parents focus on how norms and stereotypes are responsible for inhibiting young people's educational choices.

A specific example of elements that can be involved in the teaching are the knowledge and skills that boys and girls acquire outside school.

CASE STUDY

DigiPippi – technology and IT as after-school activities

The target group for the online DigiPippi⁶ initiative comprises girls aged 7-13. Every three weeks, the DigiPippi TV channel broadcasts a programme of relevant technology and IT topics which girls communicate to one another. This peer-to-peer approach supports girls in learning together and experiencing that they share an interest in IT and technology, whereas many girls have previously found it difficult to find other girls who were similarly inclined.

The website has short articles about IT and technology. In 2016, a number of workshops will be held where girls can acquire various skills, in areas such as 3D, iPad animation, blogging and programming. A sense of community, encouragement and a venue where it is acceptable to make mistakes are basic learning elements. To support the enthusiasm and desire to learn about science and technology subjects, the initiators have chosen to involve a broad segment of the local community, and a number of libraries have contacted the project and are interested in taking part.





2. Guidance counselling should stimulate the interest of girls in STEM subjects

Only a few young people indicate that student counselling had a big impact on their choice of study. Many girls in particular express how it would have been helpful if student counsellors had focused on their STEM options. There are indications that student counselling could have an impact in terms of breaking this pattern – if this were given higher priority. In this context, it is important for student counsellors to be aware of helping to create less gender-biased study guidance. Quite simply, this could involve informing girls of their educational and job opportunities within STEM subjects and disciplines.

3. Establish dialogue with parents and teachers about the importance of gender when choosing a study programme.

There is much to indicate that parents play an important part in the educational choice of girls who choose STEM. For example, 28% of the girls/women who participated in DAMVAD Analytics' questionnaire survey of students enrolled in Nordic youth study programmes and higher education programmes responded that their mother/stepmother was an important or crucial person in terms of their choice of study programme. The corresponding figure for boys/men who participated is 22%. The father/stepfather was an

important or crucial person to 22% of the girls/women who participated, whereas the same figure was 23% for boys/men. Therefore, schools and parents can engage in dialogue (e.g. at parent–teacher consultations) on widening the educational interests of girls to

CASE STUDY

National school tournament, FIRST LEGO League

“FREE CHOICE – a ten-year commitment for equal rights in Southern Norway”⁷ focused on instilling self-confidence and courage in children and young people to dare to be themselves, trust their own abilities and make free educational choices, and thus the overarching performance target was to find methods for achieving this. Specifically, the efforts involved stimulating girls' interest in mathematics and technology by participating in a national school tournament at seventh form level (FIRST LEGO League). All the elements of FIRST LEGO League are based on expertise/learning targets in *The Curriculum for the Knowledge Promotion Reform* and thus exemplify the fact that students can work on creative problem-solving and take a different approach to the themes dealt with in the curriculum.⁸

ensure they are informed about the possibilities in STEM subjects/disciplines. It is particularly important to emphasise that parents can also actively contribute to motivating their children to contemplate what they want to be in a wider context.

Thus, teachers and parents are some of the most important influential channels when children and young people make their educational choices and it is beneficial to involve both groups in this process. For instance, it is important when holding information evenings concerning education at both primary and secondary schools to focus on how gender is far too often a defining factor in choosing a study programme.

It is important for such events not to be “preachy” but instead to concentrate on explaining the importance of focusing on gender, equality and education. Similarly, the events should not be overly focused on women, but should differentiate the options for both genders.

4. Efforts to instil self-confidence in children and youths within STEM subjects

One of the most significant barriers to girls' choice of study programme is if they do not feel they have sufficient skills in the specific areas. This is also true even if the girls are actually just as adept as boys. As mentioned above, 42% of the girls/women and 35% of the boys/men

who completed the questionnaire do not think they have the aptitude to complete a science or technology study programme, which is why they did not consider such programmes. The quote below from a Danish law student who chose not to consider STEM emphasises the same barrier:

“I had the feeling that I couldn’t do this [...] Even though my science marks were actually OK. [...] I had the perception that those who study medicine are much smarter than me. So this obviously inhibited me. I didn’t feel smart enough.”

Therefore it can be crucial for teachers to be aware of involving girls in the teaching process on the girls’ own terms and telling them that they are doing a good job. In continuation of this, teachers can tell talented girls that they *are* adept and motivate them to pursue STEM studies.

5. Ensure there is a focus on gender and education as early as during the teacher training programme

As teachers exert crucial influence on students’ educational choices, consideration should be given to focusing on the role of the teacher – as early as during the teacher training programmes – because it relates to students’ educational choices. Didactic considerations, such as taking into account boys’ and girls’ differing interests in STEM

CASE STUDY

TASUKO – Gender Awareness in Finnish teacher training programmes

Over the past three decades in Finland, a number of projects have actively worked to widen and develop gender awareness in Finland’s teacher training programmes. The lessons learned in Finland seem to indicate that educational institutions which train teachers are not necessarily receptive to demands and expectations when there is a top-down attempt to implement them. The TASUKO strategy was therefore to take a networking and ambassador approach where interested trainee teachers could form different networks to establish work groups and work on the issues relating to the gender perspective that they felt were relevant to their educational institution. The many projects in Finland which have had this focus prompted a change in the curriculum of Finland’s teacher training programmes to involve the gender perspective to a greater extent. Moreover, a website has been set up where interested students can find information about the gender perspective in the programme. This was important because many trainee teachers felt that they ran into a brick wall if they sought supervision for assignments dealing with the gender perspective.

subjects and wishes for curriculum content, are important for teachers when supporting students’ educational choices. This teacher role presupposes that trainee teachers become familiar with this perspective during their studies. There are several specific examples of how to manage this: forming work groups and networks during the teacher training programmes, or appointing ambassadors tasked with determining how teachers can broadly focus on motivating young women and men through their teaching. Teachers who teach STEM subjects should also have teaching skills in this area.

6. Focus on securing educators/ teachers with the right skill-sets

For several years, primary schools have had difficulty recruiting teachers with the right skill-sets for science and technology subjects. In order for students – boys and girls alike – to become interested in and continue to be interested in these subjects, it is crucial for the teachers to have the skill-sets to teach these subjects and incorporate new methods and knowledge. A recently published Danish study shows that only about half of the teachers who teach science and technology subjects had them as their main subject during their teacher training programme. In Sweden, other studies have pointed out that roughly 25% of the science



and technology teachers teaching forms 1–7 have training in these subjects.⁹ This constitutes a major challenge, and teacher training programmes should intensify focus on boosting teachers' skill-sets in STEM subjects, because the interest of boys and girls in science and technology subjects does not happen by itself.

Notes and references

- 1 This trend in the number of women and men who choose long-cycle higher STEM education is reported in detail in the survey *Piger i STEM – kortlægning af udfordringer inden for køn, ligestilling og uddannelse i Norden* [Girls and Young Women who choose STEM – a survey of the challenges relating to gender, equal rights and education in Scandinavia] (DAMVAD Analytics, 2016).
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- 3 <http://techeq.se/>.
- 4 Jet-Net.dk is coordinated by House of Natural Sciences, a non-profit development and visitors' centre. Read more on www.nvhus.dk/forside.
- 5 Read more about the initiative here: <http://blipepp.nu/>.
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Torben Klint



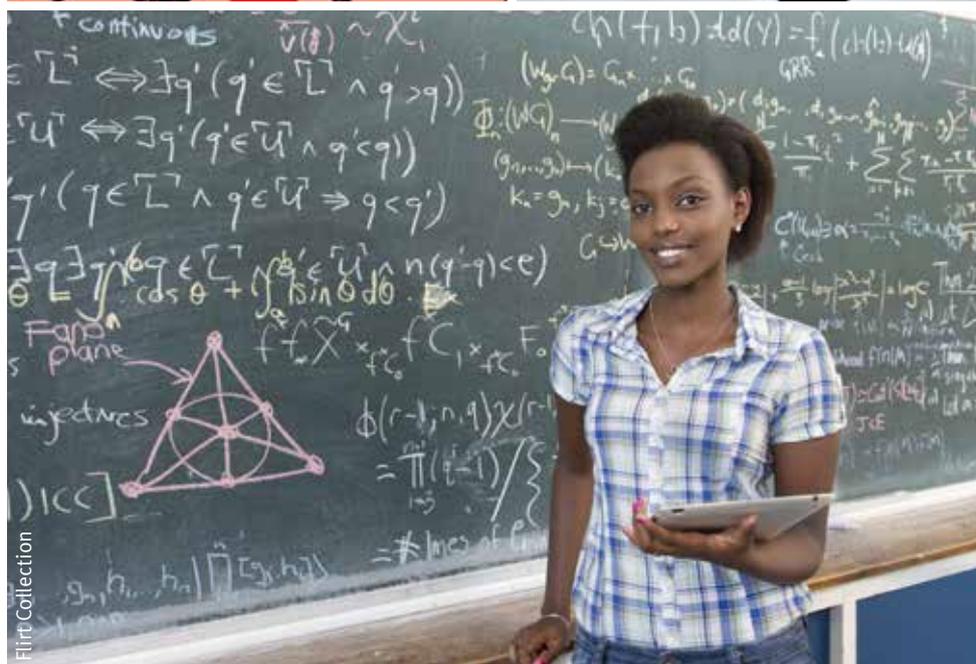
Henning Bagger



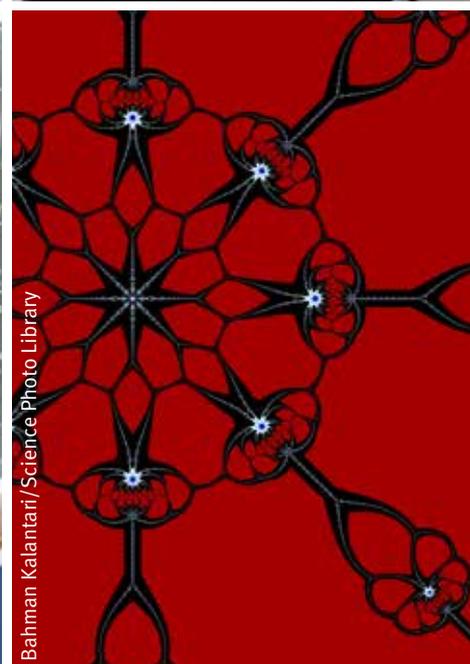
Thierry Gouegnon



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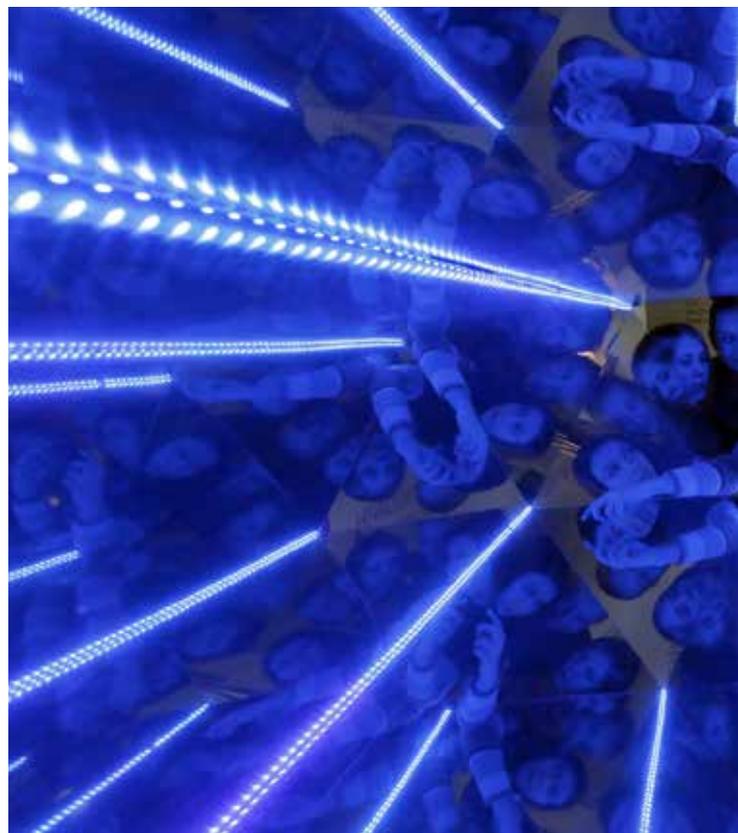
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This handbook presents good examples of how players in the educational sector, including politicians, student counsellors and educational institutions, can work to break down the gender-segregated choice of study programme. The purpose of this handbook is to provide a tool which can help identify specific problem areas and implement solutions to resolve them. For this reason, the handbook is divided into sections focusing on what can be done by practitioners in businesses, institutions of higher learning and primary schools to increase the percentage of women within STEM, but the handbook can also be read in its entirety.

The handbook evolved from a major project, which resulted in the report in *Girls and Young Women who choose STEM* – a survey of the challenges relating to gender, equal rights and education in Scandinavia. The report is in Danish.



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