

Role of the education system in gender based inequality

Ensuring continuity in the combat of gender stereotypes throughout the education system.

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INTRODUCTION

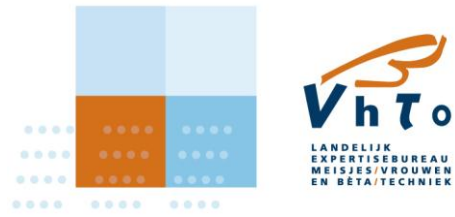
- Cocky Booij is Managing Director of VHTO.
- VHTO is the Dutch national expert organisation on Girls/Women and Science/Technology. VHTO is a foundation, a non-profit organisation. We develop and carry out a wide range of projects and activities, with the aim to increase the involvement of girls in Science, Technology, Engineering and Mathematics: the STEM-fields.
- With our projects and policy advices we address the entire educational chain. On all levels of the Dutch education system (primary and secondary education, vocational training and higher education) we try to steer toward the realisation that STEM is not only for boys, but for girls as well.
- As you may know: stereotypes of STEM not being suitable for women, explicit or implicit, are prevalent in many countries and this is certainly true for the Netherlands. In the country ranking for the Harvard Implicit Association Test we are almost the champion in associating STEM with men; the Netherlands is on one of the top positions, right after Tunisia (source: Nosek).
- This thinking in gender stereotypes is, unfortunately, still perpetuated in schools, by teachers, through curricula or school materials.

In this presentation I will tell you how we challenge these stereotypes and how we try to ensure continuity in this combat.

ACTIVITIES

Primary education (project Talentenkijker):

Challenging these stereotypes is what VHTO does (in the first place) at primary schools. During the past 2,5 years 3.500 school classes (so over 70.000 girls and boys) in Dutch primary schools have carried out our project '**Talentenkijker**' (which would translate into 'Talent Viewer'), a set of 8 lessons.



VHTO developed this project, with the financial support of our Ministry of Education, because we see that from a very early age on, boys and girls associate STEM professions with men, and with difficult, dirty, or socially uninvolved work. So, a double stereotype. If these stereotypes are not challenged at an early age, many young children already discard the idea of choosing a STEM study or profession later on.

Changing girls' and boys' perception of STEM is therefore extremely important. With our project *Talent Viewer* we let pupils explore their own talents and we train teachers to show how these talents could be used in all kinds of STEM professions. AND we train the teachers to discuss gender stereotypes with the pupils and show that women *can* and *do* work in these STEM fields.

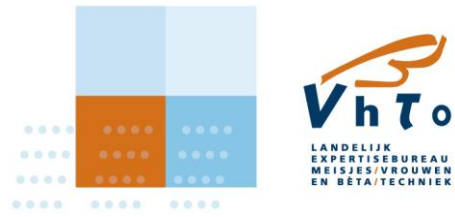
Most effective in making that last point is actually *showing* women who work in STEM to these children. We do this in two ways: firstly, by introducing them to our online image database **Dit Doe Ik** - which translates into 'This is what I do' (www.ditdoeik.nl). In this online database we have published over 300 photographs, videos and small interviews in which we show mostly female 'role models' working in STEM. This database is being used by teachers (at all levels of education) as a tool to broaden the view and to show the diversity among STEM professions *and* among STEM professionals. A part of this online database is addressing parents as well.

But we do not show only images. For these primary schools that carry out 'Talent Viewer', we also arrange a *female* STEM professional to give a **guest lecture** about her profession. During such lessons, these female professionals visit the schools and speak about their work on a 'child-friendly' level in the classroom. They speak about what their work entails, what is fun and important about it, but they also show artefacts with which they work, and often include a small practical element (like a little experiment) in their lesson.

With this project, we aim to address the prejudice that STEM professions are only for boys, for mathematical geniuses, for nerds and so on. We choose to show *both* the boys *and* the girls that a woman in a STEM profession is not an oddity. After all, if we want to break that chain of thinking in stereotypes, boys should be involved as much as the girls.

Role model database Spiegelbeeld:

Off course it was a challenge to get 3.500 school classes to participate in this primary school project, certainly if you consider the fact that for each of those classes we arranged a female STEM role model to give a guest lecture. We were able to do so because, fortunately, we have another database, **Spiegelbeeld**, which would translate into 'Mirror



Image'. In this database over 2.000 women working in a STEM profession signed up and are willing to participate as a role model in VHTO-activities.

Secondary education speed dates with role models:

These female professionals do not only give guest lessons in primary education, they also participate in **speed dates** in secondary education. When they start secondary school, boys and girls usually start to think more about their future, their goals and interests. The girls are often becoming more insecure about their abilities and talents and in need of support when it comes to choosing STEM subject. That is why, in this stage of education, we focus very much on 'role modelling', by sending groups of female STEM professionals to secondary schools, and letting them do speed dates with the female pupils. They can support girls' self-confidence and interest in STEM-related subjects

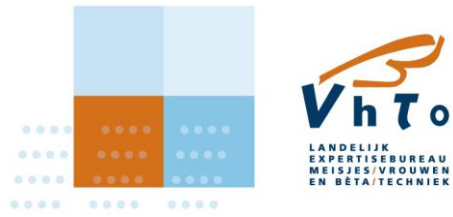
We believe very strongly in the concept of nearby 'role modelling' (and social scientific research confirms the positive effects). With speed dates we offer girls not only information about working in STEM, but also a role model to identify with. We consciously carry out these speed dates in girls-only groups. Girls are generally more insecure about their abilities than boys. With girls-only activities we make them feel freer to ask their own questions and explore their own ambitions (without peer pressure from boys).

Past year we reached over 18.500 girls in secondary education directly. VHTO carries out these speed dates for 6 years on a row already and this method proved to be, evidenced based, successful. Monitoring/research shows that at the participating 200 schools more girls choose STEM subjects and STEM studies in Higher Education.

Beside the speed dates we organise, at request of the science and math teachers, expert guest lectures on STEM topics by female professionals, for boys and girls (in order to show also the boys that women are experts in these STEM fields as well). And girls (pre exam class) can opt for a day 'work shadowing' with a role model at her workplace.

National event Girlsday:

Every year, in April, VHTO organises the national event **Girlsday**, for girls in both secondary and primary schools. We arrange for STEM companies to open their doors to groups of girls between the ages of 10 and 15, to give these girls an idea about what kind of work STEM has to offer. During this year's Girlsday (2014) over 300 companies participated, including multinationals like Shell and IBM. Over 8.400 girls visited a



company. Here the idea is: leave a positive impression of these STEM professions and companies, and show that a future in STEM does not necessarily mean working in a nerdy or dirty job. But also: Invite the companies to show that they take diversity seriously! This year Girlsday had a special focus on girls & Computer Science (ICT).

Our activities focus on children in the age between 10 and 15, because in the Netherlands it is at the age of 14 that pupils have to choose a 'subject cluster' (a profile). This is very specific for the Netherlands and some say that that is part of the reason why we have such an exceptionally low percentage of women STEM. If pupils do not choose a science cluster (in which math and science subjects are incorporated) at that young age, it is near impossible for them to qualify for a scientific or technological study later on. Therefore it is vital that they are offered a non-stereotypical image of STEM studies and professions, *before* they choose a subject cluster.

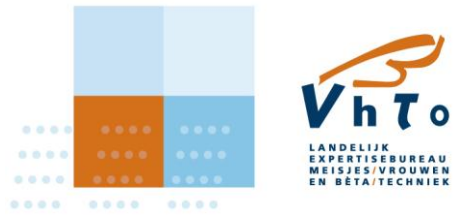
How do we ensure continuity?

One of our main principles is to accompany school projects and activities with teacher training. And to involve on the one hand parents and on the other hand school principals and policy makers.

We offer schools our project for free (projects are being paid for by the Ministry of Education or by the business community), but we ask the school something in return: teachers and school career advisors should participate in our gender training program. That is the package deal! Teachers find it extremely difficult to invite professionals in the classroom. So we organise that for them, but in return they must be willing to be trained on gender awareness.

Why do we bother?

Why do we have to pay attention to this low percentage of women in STEM? Is it a problem, if this is what these girls and women want? I agree, of course women should choose as they wish, and be free to develop to their full potential. But in the case of STEM, the fact is that girls and women do not make a free and unbiased choice. Many teachers unknowingly teach girls that they are less adept at science and mathematics, by encouraging girls less than boys, even if their respective scores are the same. Girls generally are more critical of themselves than boys, and also underestimate their own math and science abilities.



We know that girls rule out STEM professions as an option, even though they do not know what working in a STEM field actually entails and even if they are talented in STEM. All of this is why we focus on the education system to change the thinking in stereotypes about women and STEM.

More women in STEM are needed. In the Netherlands there is a huge lack of properly schooled STEM professionals, which hampers technological innovation and economic growth, and women could fill in part of that gap. Furthermore, embracing diversity and having a good gender balance is known to be good for any organisation. But most importantly, there is the ethical aspect of the matter. Equal education for boys and girls is a right, and being able to develop to your full potential is part of that. If we see that math or science-gifted girls in our societies are held back from STEM careers due to gender stereotypes and biases, that is an injustice. Therefore, I want to stress the importance of addressing the issue of gender stereotyping and STEM *throughout* the education chain, and to be *consistent* in addressing it. It is a persistent problem and it deserves our attention.

I hope that today I have given you an idea of the VHTO activities to combat stereotypes in the Netherlands, with the (financial) support of our Ministry of Education, Culture and Science.