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# Girls and STEM choice: Dutch stimulation policy

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# Introduction

This paper has been written for the seminar 'Gender segregation in the labour market and education' to be held in Copenhagen on 29-30 September 2015. The Netherlands has been selected as a case for best practices on account of Dutch policy aimed at stimulating girls and women to choose a study and subsequent career in Science, Technology, Engineering or Mathematics (STEM).[1] The present paper is thus concerned with specific forms of gender segregation in the Netherlands.

The good example which the Dutch government provides for the stimulation of STEM participation among girls is thus the main topic of this paper. As is often the case, however, the motivation for this sophisticated approach is that the problem of gender segregation has strongly manifested itself in the Netherlands in the past. This side of the story will also therefore be given attention in this paper.

The author completed her PhD in 2005 on the international phenomenon of unequal participation in STEM education. She has conducted extensive research on this same topic since then. In addition, various policy papers and research reports are drawn upon. And the website of the Dutch National Expert Organisation on Girls/Women and Science/Technology (*VHTO, Landelijk expertisebureau meisjes/vrouwen en bèta/techniek;* www.vhto.nl) has been frequently consulted. The author would like to thank Lieke van Schouwenburg, policy staff member from the Ministry of Education, Culture and Science and Cocky Booij, director of VHTO, for their input and comments on previous versions of this paper.

# 1. Dutch policy to encourage girls to choose STEM

## 1.1 Background and general policy context

### 1.1.1 The position of girls and women in STEM education and in the labour market

Just as in many Western countries today, girls now have a lead on boys in many respects in Dutch education. Female students are participating more than male students in higher forms of secondary and tertiary education in the Netherlands and also graduating more quickly on average.[2] Compared to female students, male

[1] The acronym STEM is used more broadly and also therefore refers to ICT, Science & Technology, Math & Science subjects and programmes in secondary education and beyond.

[2] See Appendix for a short description of the Dutch school system.

students show more frequent delays in the form of repeating a year or changing study; more frequently moving to a lower level of education during the course of their study, and overrepresentation among dropouts and in special education (Driessen & van Langen, 2010). Although these so-called vertical educational inequalities (gender differences in the final level of education attained) clearly manifest themselves in all sectors of Dutch education, they cannot be referred to as extreme. Rather than gender, that is, parental level of education and ethnic background are still the best predictors of the final level of education attained by students today.

In light of the generally favourable educational position of girls in the Netherlands, it is remarkable that the proportion of Dutch girls and women choosing a STEM field of study is strikingly low for all levels of education. In the 2006-2007 academic year, for instance, almost 520,000 Dutch students obtained degrees in secondary or tertiary education. Of these students, 107,000 graduated from STEM courses and programmes but only 19,000 of these graduates (18 %) were women (Berkhout & Volkerink, 2015). The underrepresentation of women in STEM education is much greater in the lower levels of study than in the higher levels of study, by the way.

Also viewed from an international perspective, the STEM participation of women in the Netherlands is strikingly low. In other European countries, the share of STEM-participating women is considerably larger than in the Netherlands. This is demonstrated by Table 1 which provides an overview of the percentage of female university students graduating from the different academic STEM fields of study in 2010 across a number of EU countries.

*Table 1 – Percentage of qualifications awarded to women in tertiary-type A* STEM fields of study (2010). OECD, 2012.*

| | **Engineering, manufacturing & construction** | **Physical sciences** | **Mathematics & statistics** | **Computing** |
|---|---|---|---|---|
| Austria | 25 | 35 | 37 | 15 |
| Belgium | 25 | 33 | 44 | 10 |
| Denmark | 32 | 38 | 36 | 21 |
| Finland | 21 | 50 | 48 | 28 |
| France | 30 | 39 | 36 | 16 |
| Germany | 22 | 43 | 61 | 15 |
| Ireland | 21 | 44 | 31 | 22 |
| Italy | 33 | 41 | 53 | 15 |
| **Netherlands** | **20** | **24** | **32** | **11** |
| Norway | 27 | 38 | 31 | 20 |
| Poland | 33 | 65 | 66 | 16 |
| Portugal | 31 | 49 | 60 | 24 |
| Spain | 34 | 51 | 51 | 19 |
| Sweden | 29 | 48 | 36 | 24 |
| UK | 23 | 43 | 40 | 19 |
| **EU21** | **28** | **45** | **49** | **19** |

***** including advanced research programmes

In the fields of study traditionally pursued by women, such as health care and teaching, men show an equally strong underrepresentation as women do in STEM. Different than for the vertical educational inequality according to gender in the Netherlands, the horizontal inequality (=gender differences in the choice of

educational field of study) can be referred to as extreme. In a logical extension of this, the extent of gender segregation is even stronger for the labour market in the Netherlands. We can thus speak of a cumulative problem: for every educational transition or moment of choice, an additional outflow of female STEM potential can be seen to occur. A smaller percentage of girls than boys choose STEM courses and programmes during secondary education; this happens again during the transition to tertiary education (i.e., more women than men again drop out of the STEM 'pipeline'); and it is seen to occur again during the transition to the labour market. One year after attainment of a tertiary technical diploma, only 37 % of the women are employed in a technical field as opposed to 64 % of the men (Berkhout & Volkerink, 2015).

For various reasons, this gender segregation in education and the labour market can be considered undesirable. First, the segregation is in conflict with the meritocratic principle that educational achievement should be a reflection of personal competence and not such characteristics as social class, ethnic background or gender. Second, gender segregation is both socially and societally undesirable because every organisation and sector can benefit from diversity and an adequate balance between the percentages of men and women. Third and specific to the gender segregation in the STEM labour market, one can speak of economic undesirability given the general shortage of well-educated STEM personnel which employers have been reporting for years now in the Netherlands. Fourth and finally, by not making optimal use of their STEM talents, women increase their risks of economic dependence. The terms of employment in the STEM sector are much more favourable than those in the health and education sectors – not only with respect to salary but also legal status (e.g. temporary versus permanent employment, full- versus part-time employment). This is particularly relevant in light of the fact that Dutch women – despite their favourable educational positions – still lag behind men considerably in the labour market.

### 1.1.2 Explanations for gender segregation in STEM

For years now, research has been done on the causes of the lags in the educational STEM participation of girls and women in the Netherlands and other Western countries (e.g., van Langen, 2005, van Langen & Vierke, 2009; Yazilitas e.a., 2013). Among the explanations offered are the attitudes of the girls themselves. Girls have been found to value their STEM achievements too lowly due to a lack of confidence and low self-esteem even though their STEM achievements are equal on average to the STEM achievements of boys. In part as a result of this, girls are found to derive less pleasure from STEM subjects, estimate the utility of STEM subjects lower and have less motivation to pursue STEM study subjects and programmes than boys; they also aspire less to STEM careers than boys.

The direct influence of the environment on the attitudes and choices of girls is also offered as an explanation for the observed STEM gender segregation in education. The environment includes parents and peers but also teachers and school guidance counsellors. These groups often hold gender-stereotyped ideas about the suitability of women for STEM fields and tend to advise girls more conservatively and negatively with regard to STEM choices than otherwise similarly achieving boys.
In addition, there is the influence of the broader societal context, which includes the prevailing socio-cultural ideas about women in relation to STEM which can be stereotyped and biased. Characteristics of the STEM labour market have also been found to be of relevance, including the sometimes limited possibilities for combining a career with family and the limited visibility of female role models. A final contextual

characteristic is the educational system itself. The system often strengthens gender-stereotyped choices, for example, by requiring important choices to be made at an age when peer pressure is known to be strong. Alternatively, the system can possibly encourage the making of non-stereotyped choices by, for example, requiring *all* students to follow at least one STEM line of study through to the end of their school careers. But this is currently not the case in the Netherlands and many other Western countries.

The explanations offered here hold for the Netherlands as well as for other Western countries. One can speak of lags in the STEM participation of women relative to men in other Western countries as well (OECD, 2012, 2015; see also Table 1). In one way or another, however, the whole of contributing factors and interactions between these factors has led to the STEM participation of girls and women in the Netherlands lagging more strongly behind the STEM participation of girls and women elsewhere.

## 1.2 The goals and target groups of the good practice

### 1.2.1 General policy framework

The stimulation policy of the Dutch government to encourage STEM participation among girls and women has its roots in two lines of policy, namely general STEM stimulation policy and general women's rights policy.

The *general STEM stimulation policy* has been aimed at generally increasing the participation in STEM in both education and the labour market. The current policy was laid down in the National Technology Pact 2020 (2013). This is a joint initiative of the national government, business community, trade unions, educational community and regional stakeholders. In the National Technology Pact, goals which concern the entire chain of education and labour market have been formulated for 2020. The National Technology Pact 2020 has also provided the basis for the Action Plan 'Choosing Technology' with its focus on primary and secondary education in 2015 and 2016. Specific target groups within this policy are both girls and minority students on account of their low STEM participation.

The *women's rights policy 2013-2016* of the Dutch national government is aimed at enforcing equal rights for women in all areas of society including education and the labour market (OCW, 2013, 2014). Equal participation for women and men, economic independence for women, utilisation of talents, expansion of diversity and combat of gender segregation are key concepts here.

### 1.2.2 STEM stimulation policy for girls and women

As already mentioned, the endeavour to increase STEM participation among (minority and non-minority) girls fits into the lines of policy laid out by the Dutch government. The measures introduced to attain increased female STEM participation in particular are aimed at the following.

- Shifting perceptions and assumptions about 'girls and STEM' in addition to combatting gender stereotyped choices and behaviour.

- Informing girls about attractive STEM possibilities and introducing more female STEM role models.

- Raising awareness of gender biases and segregation among parents, teachers and schools via training.

The Dutch government has placed the *implementation* of this policy in the hands of the non-profit organisation VHTO, the Dutch National Expert Organisation on Girls/Women and Science/Technology. The mission of this non-profit organisation is to further the STEM participation of girls and women. For this purpose, the organisation has developed a line of activities and products over the years to address the entire chain of primary education to labour market participation.

The range of activities employed by VHTO can be divided into three categories.

- Information provision with regard to STEM study programmes and professions for students at all educational levels and their parents.

- Training of teachers, student advisors and school guidance counsellors with respect to gender awareness and stereotypes involving gender and STEM but also appealing STEM education options for girls and women.

- Policy recommendations for primary, secondary and tertiary educational institutions to promote gender diversity and measures which facilitate and encourage the STEM participation of female students.

In the following, those VHTO activities which directly connect to the goals of the national government and are financed at least in part by the Ministry of Education, Culture and Science will be described.

#### *1.2.2.1 Primary education*

For primary education, VHTO has developed the following set of offerings.

- Project Talent Viewer [*Talentenkijker* in Dutch] is mainly aimed at breaking stereotypes about STEM, including gender stereotypes. Talent Viewer consists of a series of lessons in which pupils (age 10-12 years) explore their own talents, on the one hand, and teachers are trained to show how these talents can be put to use in all kinds of STEM professions, on the other hand. The teachers are also trained to discuss gender stereotypes with pupils. In addition, pupils are shown that women can and do work in the STEM fields being discussed. This is done by introducing the pupils to the online image database *This Is What I Do* [*Dit Doe Ik* in Dutch] (see below). Also schools using the Talent Viewer receive a visit from a female STEM professional who gives a fun but informative presentation on her profession.

- In the online database *This Is What I Do* (www.ditdoeik.nl), VHTO has published over 300 photographs, videos and brief interviews showing mostly female role models working in STEM. Part of this online database addresses parents as well.

- Girls Day is an annual event organised for girls 10 to 15 years of age to give them an opportunity to be a guest at a STEM business or research institution for a day or half day. The aim is to acquaint girls at a young age with STEM topics; give them a broader image of STEM activities; and meet female STEM professionals. At the same time, Girls Day aims to enlarge the involvement of businesses in STEM education and public relations for girls. The event is also

used to attain wider regional and national media attention for STEM businesses and the shortage of women in STEM jobs.

- In-service training trajectories for individual teachers and school teams are organised by VHTO as well. These trajectories are aimed at promoting the gender-aware teaching of STEM subjects. The participants are given insight into the problems concerned with gender and STEM by presenting them with international figures on achievement and participation. Participants are also made aware of the both conscious and unconscious stereotyped ideas regarding gender and STEM. And they are given practical pointers for their own educational practices in STEM subjects.

#### *1.2.2.2 Secondary education*

Both Girls Day and the online image database *This Is What I Do* (see above) are also intended for girls in secondary education and their parents. In addition, VHTO has the following offerings for students, teachers and schools in secondary education.

- Speed Dating. VHTO offers girls in secondary education (age 15-17) information and enlightenment via so-called ‘‘speed dates’’ with female STEM professionals. The speed dates contribute to an orientation towards STEM, choice of STEM directions of study and selection of a STEM follow-up field of study. The speed dating takes place at the school under the guidance of VHTO. An entire session lasts about 1.5 hours. During the introduction to the session, short films and fun facts are used to stimulate the girls to broaden their views on STEM. Thereafter, female role models (i.e. professionals and/or students) conduct brief discussions with the girls about work, education and school career choices during four rounds of 15 minutes each.

- Decision-strengthening trajectories are available for girls in the next to last year of a STEM direction of secondary school study. The trajectories are intended to see that girls (and their parents) more broadly orient themselves towards a follow-up STEM education programme. This is done in a number of steps in which the girls orient themselves from general to specific, broad to narrow. The first step is an initial meeting at which the girls together with their parents are given more information on the decision-strengthening trajectory and then speed date with a number of female STEM professionals (see above). The second step involves attendance of an open day at a follow-up STEM programme or participation in such a programme for a day. In the third step, the girls ‘shadow’ a female professional for a day at their work in an area in which the student is interested. In a closing meeting at the school, the girls report on what they have seen and reflect upon their experiences together with each other and their parents.

- Training sessions for STEM teachers and study advisors. The participants are informed about the specific choice processes which female students go through in the selection of not only courses and a direction of study (halfway through secondary school) but also the selection of a tertiary programme of study. With the teachers, attention is also paid to the interactions in the class and the provision of practical pointers to help teachers interest more girls in a STEM career in the future.

- Policy discussions sessions are conducted at the school by VHTO. Representatives of the administration, study advisors and STEM teachers are present at these sessions. Together, what is already being done and what can be further done to embed the topic of 'girls and STEM' within the school organisation are discussed. To prepare for this discussion, the school can conduct a so-called 'gender scan' which allows them to obtain a picture of the situation in the school and identify gaps.

#### *1.2.2.3 Tertiary education*

VHTO offers tertiary educational institutions in the Netherlands many forms of support to successfully recruit, retain and educate female STEM students.

- Public relations activities for female STEM students. These activities are aimed at informing students about possible follow-up programmes and professions. The activities also allow fellow female STEM students to meet each other.

- Guidance of female STEM students involved in vocational training with the choice of follow-up training or the transition to work. The students can 'shadow' a female STEM professional and also participate in so-called 'mentoring circles'.

- Training of teachers and school guidance counsellors on the specific instruction and guidance needed by female STEM students and the specific problems they can encounter in a predominantly male environment.

- Policy advice for the handling of gender diversity within education programmes, including a check on the gender diversity rate of the information and education materials.

- Working meetings in which so-called gender contact/monitoring staff meet, discuss and exchange developments, study insights and project results in addition to working on the development of joint projects.

## 1.3 The legal and financial provisions to implement the good practice

As already mentioned, the Dutch government has left the implementation of the stimulation policy for STEM participation of girls and women to VHTO. This has been done via subsidies provided for periods of one to several years. Targets (i.e., achievement agreements) have been attached to the subsidies and mostly pertain to the number of students and schools reached.

The implementation of general STEM stimulation policy has been arranged in a similar manner. The most important contractor for the implementation of this policy in the Netherlands is the National Platform Science & Technology [*Platform Bèta Techniek*). For the specific part of this policy aimed at girls and women, the Platform has made agreements with VHTO. The financing of VHTO thus runs largely via the National Platform.

The financing of VHTO activities has not been arranged for a longer period of time, thus, but runs via project-based subsidies which VHTO receives directly from the government or via the National Platform. In 2015, for example, a subsidy of

€ 200,000 was received directly from the Ministry of Education, Culture and Science. The majority of this (€ 130,000) has been allocated for the Girls Day; the remainder will be spent on the working meetings (see section 1.2.2.3). The subsidy which VHTO received via the National Platform Science & Technology in 2015 for the implementation and conduct of the Action Plan 'Choosing Technology' in primary and secondary education involved € 765,000.

Both the National Platform and VHTO are also doing their best to promote public-private cooperation. A higher level of STEM participation for girls (and other students) is, after all, in the interest of Dutch business in light of the shortage of STEM personnel in general. A good example of such cooperation is the Girls Day in which the participating businesses invest considerable time.

Educational institutions – from primary to tertiary – can participate at no cost in the activities of VHTO for students, teachers and other staff. The films and photos included in the online database can be downloaded for free by students and parents via the VHTO website.

## 1.4 Institutional arrangements and procedures of implementation

As already mentioned, VHTO makes achievement agreements with funding agencies (i.e. the Ministry of Education, National Platform for Science & Technology) for the number of students and schools to be reached. Considerable time and money are therefore invested in the recruitment of participants with the aid of an attractive website, all kinds of printed and digital promotion materials and the organisation of national conferences. The National Platform is also involved in these efforts.

It is nevertheless up to the schools themselves to decide if they want to participate in an activity being offered by VHTO for their team or students. National agreements have, however, been made between the government and the national organisations for secondary education to raise the STEM participation of students in general and girls in particular. Schools receive funds for the realisation of these and other agreed-upon objectives, but they are free to choose which objectives are given priority and how to put their funding to work.

# 2. Results of the good practice and its impact on achieving gender equality

## 2.1 Key results in relation to the baseline situation, goals and target groups

### 2.1.1 Number of students and schools reached

Within the framework of the target agreements made with the funding agencies, VHTO keeps track of the number of students and schools reached per year. In the following, an impression is provided on the basis of a few participation figures for the year 2014, taken from the VHTO Annual Report.

In 2014, the lesson series Talent Viewer was provided for 1,564 primary school classes and – in such a manner – 36,441 students in the last two years of Dutch

primary school (both boys and girls age 10-12) were reached. It is estimated that about 10 % of all primary schools in the Netherlands were thus reached in that year.

At 55 higher secondary schools (i.e. schools preparing students for higher level education) and 73 pre-vocational secondary schools, 220 speed date sessions and 33 decision-strengthening trajectories were conducted in 2014. On 12 occasions, VHTO conducted training for pre-vocational education teachers. It is estimated that 10-20 % of the schools for secondary education in the Netherlands thus participated in one or more of the aforementioned activities.

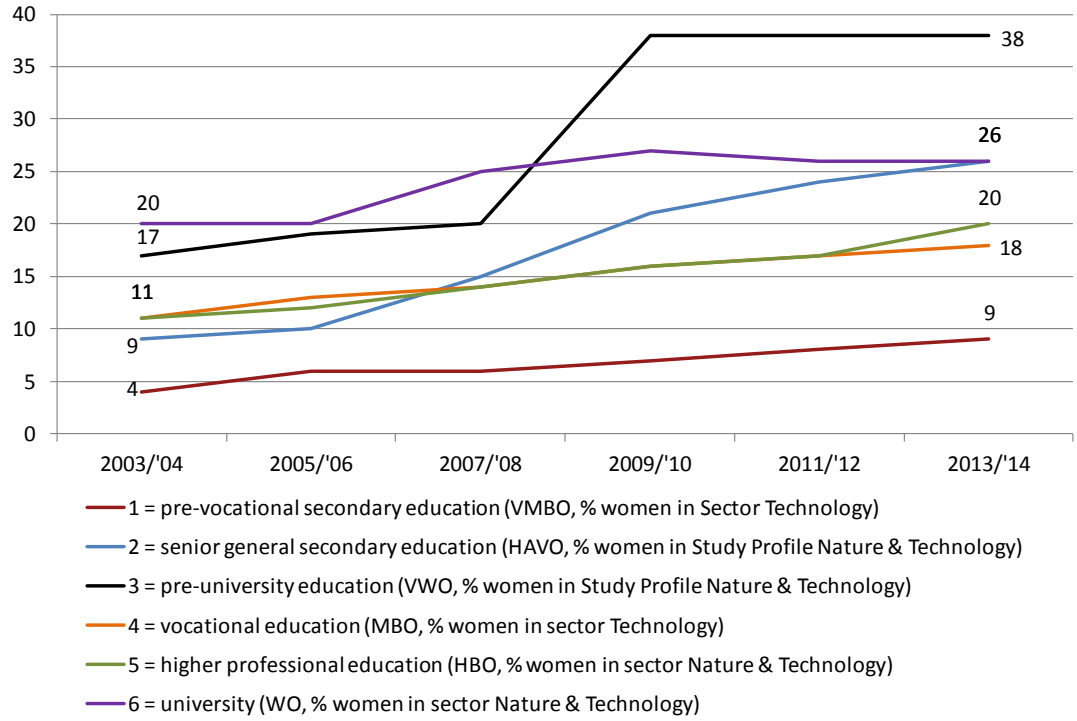
The Girls Day in 2014 involved 305 businesses. These organisations opened their doors to 97 primary schools and thus almost 2,000 girls in the last two years of Dutch primary school (age 10-12). In addition, almost 6,500 girls from 119 schools for higher secondary education and 54 schools for pre-vocational secondary education were involved as well (age 12-15).

### 2.1.2 Successful increase of STEM participation of girls and women

Over the past few years, a clearly rising line can be seen for the proportion of girls and women in STEM at all levels of Dutch education[3] (see Figure 1). The rising line is stronger for the higher level of secondary education and higher tertiary education than for pre-vocational and vocational education. The extent to which the observed rise is a consequence of the activities of VHTO and the stimulation policies of the Dutch government cannot, however, be determined. Other societal factors such as economic developments and the status of the labour market presumably play a role as well. Research has nevertheless shown the choice of STEM directions of study and selection of follow-up STEM study programmes to be greater for schools in which VHTO activities were organised than for other schools.

[3] The general proportion of women in all levels of Dutch education varied in 2014 between 47 % for pre-vocational secondary education and 53 % for higher professional education and university. The proportions have hardly changed between 2004 and 2014.

*Figure 1. Proportion of women in STEM education between 2004 and 2014 according to level of education (SCP/CBS, 2014).*




## 2.2 Challenges, obstacles and constraints encountered

For nearly all VHTO activities, female STEM role models are needed. These women are needed to give guest lectures, participate in speed dates, let girls shadow them at their workplace and so forth. VHTO has a large database of female STEM role models, but more role models are needed due to the great demand from schools for VHTO activities. Role models are receiving more requests than they can accept. The role models often take vacation days from their work for VHTO activities; it would obviously be better if they could participate in VHTO activities as part of their job. But this requires the cooperation of their employers.

VHTO has been able to count on major support from businesses and female professionals until now. The current reach of VHTO is nevertheless confined by the extent of this cooperation and the budget made available by the government for the organisation of stimulation activities by VHTO. If more businesses would decide to cooperate on VHTO activities and greater funds were made available, more schools and girls could be reached.

The organisation of an activity such as a guest lecture, a speed date session or especially the Girls Day takes considerable VHTO time and effort. The process of coordinating the schedules of schools and role models; determining their preferences in terms of content, level and location; and arranging for the necessary materials and space is a logistic puzzle, moreover, which requires not only considerable time but also thought.

# 3. Strengths and weaknesses of the good practice

A strong point in the approach adopted by VHTO is that the entire chain from primary education to the labour market is served. Stereotypes and prejudices involving gender and STEM emerge early but also call for continued attention. In addition, the different phases in the school careers of students require specific attention to different matters, which is exactly what VHTO provides.

Another strong point is that not only students are targeted but also teachers, advisors, parents and the educational institutions themselves. Research shows (see section 1) that the environment of students plays a crucial role in their choice of STEM or not. VHTO acquaints not only students with STEM study programmes and professions but also parents and teachers who – depending on their own backgrounds – may or may not be familiar with the STEM world and possibilities. In addition, VHTO pays explicit attention to unconscious stereotypes and prejudices among all target groups. These stereotypes often underlie girls not choosing STEM but also the negative recommendations made by parents, teachers and advisors.

An additional strength is the utilisation of female STEM professionals by VHTO to stimulate STEM participation at all levels of education. Whether girls of 11 years or women of 21 years are the target, appealing and interesting role models are important. Even better, of course, is having 'live' role models enthusiastically tell their stories. This is done via the speed date sessions, via the films and photos placed online by VHTO and via the visits of girls to STEM places of business. Presumably, the curiosity and fantasies of girls can be stimulated and greater inspiration gathered using such materials as opposed to traditional, printed materials.

The aforementioned strong points are transferable, in principle, to other countries. It should be kept in mind, however, that the organisation of such stimulation activities and resources requires immense time and effort. The cooperation of businesses is also an important prerequisite.

It should also be noted that the participation of the schools in the VHTO activities reported on here is, in principle, completely voluntary. Schools are thus free to ignore Dutch STEM stimulation policy. In the Netherlands, schools are rarely held accountable for a low rate of student STEM participation in general and female student STEM participation in particular. The funds which schools can put to use for the promotion of STEM participation are not, moreover, earmarked for such purposes. All of this fits into the Dutch system of educational funding, which gives schools a relatively great degree of freedom with regard to the manner in which their teaching is organised. A number of years ago, schools received a monetary reward when they obligated themselves to work towards a 15 % increase in student STEM participation and actually realised this. Under current government policy, this incentive has been done away with.

The sustainability of the good practices reported on here is threatened to the extent that VHTO only receives relatively brief periods of funding and never knows whether the subsidies will thus be available for longer periods of time. This is linked to the political circumstances in the Netherlands. Governments can obviously vary in the extent to which they judge women's rights and the combat of gender segregation to be important. The perceived necessity of investing in greater STEM participation in

general and by women in particular also varies from year to year – under influence of economic developments and the political colour of the ministers behind the wheel.

A final point concerns the distinction between general STEM stimulation policy and specific STEM stimulation policy targeting girls and women in particular (see section 1.2). The implementation of these lines of policy has been allocated to two different parties (i.e. the National Platform Science & Technology and the VHTO) although there is some cooperation. The danger of this separation is that policy is partitioned too much, the stimulation activities for girls in particular may get pushed into the margin and so-called gender-inclusive policy may not get implemented. To illustrate: In general stimulation policy, two specific target groups are currently mentioned separately, namely girls and minority students, and specific activities targeting minority girls may therefore get neglected. It should be noted that some VHTO activities are also aimed at boys and men (e.g. the Talent Viewer lesson series). Other components are aimed at girls but nevertheless very suited to promote the STEM participation of boys and men as well (e.g. speed date sessions with male STEM professionals).

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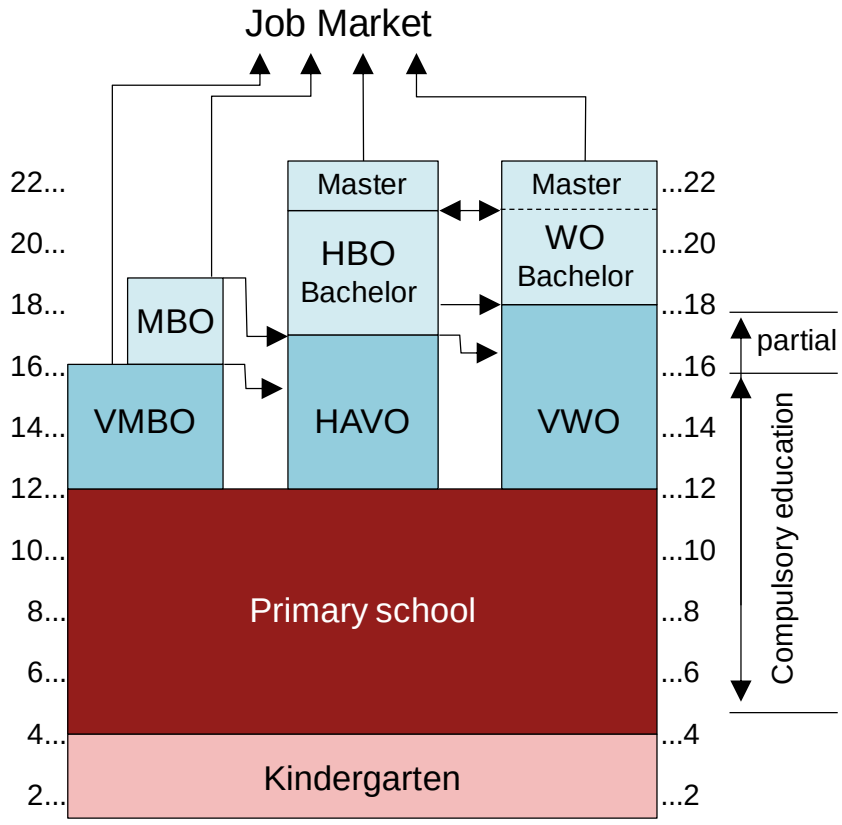
# Appendix: The Dutch School System




In the Netherlands, secondary school starts around the age of 12 years and follows primary school. Education is compulsory between the ages of 4 and 16 in the Netherlands (and partially compulsory between the ages of 16 and 18), which means that all students must attend secondary school.

Secondary school in the Netherlands consists of three main streams. *VMBO* (*voorbereidend middelbaar beroepsonderwijs* or literally: preparatory middle-level vocational education) which has four grades and is subdivided into several levels. *HAVO* (*hoger algemeen voortgezet onderwijs* or literally: higher general continued education) which has five grades. And *VWO* (*voorbereidend wetenschappelijk onderwijs* or literally: pre-university secondary education) which has six grades. After completing a particular stream, it is possible for a student to enter the penultimate year of the next higher stream and thus progress from *VMBO* to *HAVO* or *HAVO* to *VWO*.

Successful completion of a particular stream of secondary education grants access to a specific level of tertiary education. After *VMBO*, a student can enter a *MBO* programme (middle-level vocational education). A *HAVO* diploma allows entry to a *HBO* programme (higher professional education). Only a *VWO* diploma allows entry to WO (research education or, in other words, university). Students can opt for a lower level of tertiary education but not a higher level without additional preparation.