

Students' Learning Performance and Study Careers in Different Learning Pathways in Dutch VET Compared

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Abstract: This study was designed to examine the effects of the Green Lyceum (GL) variants as new continuing learning pathways in Dutch VET. The GL were compared with a more traditional pathway (e.g., pre-vocational secondary education - secondary vocational education) in terms of students' learning performance and study careers. GL students and comparable students following the regular pathway did not appear to differ in terms of mean final exam scores for four core subjects in the first part of their educational programmes. However, it should be noted that, on average, GL students take this final exam one year earlier than regular students (after three instead of four years) because of the acceleration of the learning trajectory in the GL programme. The different GL variants with their respective educational formats did not lead to significant differences in learning performance. Conclusions with respect to students' study careers will be presented at the conference.

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1 Introduction

Many countries explicitly strive to enhance the educational level of their inhabitants to be able to face the challenges of modern society. A central goal in their educational policy is that higher percentages of people should reach higher levels of the educational system (OECD, 2010). This trend is also visible in The Netherlands, the country in which this particular study is carried out: One of the key elements of Dutch educational policy of the last decades is that percentages of students reaching and successfully finishing higher vocational education should increase (Dutch Educational Council, 2014).

To enable many students to reach higher vocational education, it is crucial that boundaries between successive educational levels are reduced. In other words, students should be enabled to develop their knowledge, skills, and competencies (required not only for dealing with present and future professional core tasks but also for their own personal development from the perspective of further education, lifelong learning, employability, and citizenship; see also Wesselink et al., 2010) in seamless pathways without artificial barriers between educational levels (Harris & Rainey, 2012; Kuijpers et al., 2010).

The Vocational Education and Training (VET) system in The Netherlands consists of three levels: pre-vocational secondary education (vmbo), secondary vocational education (mbo), and higher vocational education (hbo). The transitions from one VET level to the next are often problematic for students with high drop-out rates as a result (Visser et al., 2010). For many students, the various educational programmes corresponding with successive educational levels represent separate worlds, which makes it difficult for them to link and integrate the content of these programmes (Biemans et al., 2013).

Comparable transition problems between successive educational levels have been recognised internationally as well (see e.g. Hoelscher et al., 2008). These transition problems endanger educational policy to enhance the general educational level and seem to require a curriculum design solution, i.e. the design and implementation of new continuing learning pathways (Biemans et al., 2013). The aim of these continuing pathways is to ensure curriculum continuity of successive educational programmes and, thus, to promote and streamline students' knowledge and skill acquisition and competence development (Van Schoonhoven et al., 2010). Optimal transitions are not only important for students but also for school organisations representing successive educational levels, the labour market, and society as a whole.

Therefore, the Dutch government has stimulated the design of such new continuing pathways in VET (Dutch Ministry of Education, Culture and Science, 2005). Continuing pathways can be defined as sequential educational programmes combined into a new educational programme characterised by curriculum continuity in particular competence areas or subjects lasting several years, and encompassing more than one qualification level (e.g., vmbo and mbo) (Biemans et al., 2013).

Prominent examples of continuing pathways are the 'Green Lyceum' (GL) variants in the agricultural (or 'green') domain, covering vmbo and mbo levels in 5 or 6 years instead of the regular 8 years and leading to a 4/5 qualification level in the European Qualification Framework (European Commission 2008). The first GL started in the years 2007 or 2008 with relatively small student numbers in 5 schools in 3 different VET institutes. In the school year 2014-2015, GL variants are offered by 14 schools of 6 VET institutes spread over The Netherlands to more than 1000 students, which is a substantial number in the 'green' educational sector. Students in all GL variants obtain a separate prevocational (vmbo) diploma in addition to the vocational (mbo) diploma at the end of the trajectory. The GL are specifically designed for students with predicted cognitive abilities to reach the hbo level combined with a preference for practical assignments (see also Biemans et al., 2013).

This study was designed to examine to what extent the GL offered a solution for the above-mentioned transition problems. Therefore, these continuing pathways to hbo were compared with a more traditional pathway to hbo (e.g., regular vmbo-mbo) in terms of the students' learning performance and their transitions through the respective educational programmes (study careers). The study focussed on the first phase of their educational programme (vmbo). The second phase of their educational programme (mbo) was not taken into account since substantial data from students in the second GL part were not available yet.

In the present study, the following research questions were formulated:

- Do GL students and regular vmbo students differ in terms of learning performance (i.e., vmbo final exam scores)?
- Do students from the various GL institutes differ in terms of learning performance?
- Do GL students and regular vmbo students differ in terms of percentages of students who obtain a vmbo diploma?
- Do the various GL institutes differ in terms of percentages of students who obtain a vmbo diploma?
- Do GL students and regular vmbo students differ in terms of percentages of students who proceed with the GL or mbo programme after obtaining their vmbo diploma?
- Do the various GL institutes differ in terms of percentages of students who proceed with the GL programme after obtaining their vmbo diploma?

The first two research questions will be answered in the present version of this paper while the other questions will be addressed at the International VET Conference in Bremen (students' study careers in the different learning pathways are currently being analysed).

2 Method

Participants and design

To examine the first two research questions, the group consisting of all 165 GL students who had passed their vmbo exam in the school years 2012-2013 and 2013-2014, as registered in a national student database, was taken as the starting point. These students came from seven schools of three different Dutch 'green' VET institutes (the first three institutes that had started a GL programme already in 2007 or 2008).

Next, a control group of regular vmbo students was composed that resembled the above-mentioned group of GL students as much as possible in terms of the following student characteristics: general cognitive ability test score (based on the same standardised test taken by the students in primary education), gender, and year of examination (2013 or 2014). To fill the control group, first, individual regular vmbo students from the same institutes who matched individual GL students in terms of the student characteristics mentioned above were selected from the national student database. As next steps to complete the control group, comparable regular vmbo students from schools from the same municipality, from the same region, and from the same province were successively added to the control group. This procedure resulted in a control group of regular vmbo students (in

fact the top segment of regular vmbo students in terms of general cognitive ability test scores) that was comparable to the group of GL students.

In the data analyses related to the first two research questions, learning performance data of 280 students were included (142 GL and 138 regular vmbo students; 157 male and 123 female students). This was caused by the fact that not for all students a general cognitive ability test score was available in the national student database and not all students had vmbo exam scores for all relevant subjects (see next paragraph).

Dependent variables

To measure students' learning performance, their national vmbo final exam scores for the following four subjects were taken (these exams were identical for GL and regular vmbo students): Dutch language, English language, Mathematics, and Biology. These subjects can be regarded as core subjects in the GL and vmbo curricula. At this point, it should be noted that the final vmbo exam as taken by GL and vmbo students includes other subjects as well, but these are not compulsory or selected by a vast majority of students. Therefore, these other subjects could not be taken into account in the analysis of students' learning performance.

Data analysis

To compare the learning performance of the GL students and the regular vmbo students, a MANCOVA with the 4 exam scores (NL, ENG, MATH, and BIO) as dependent variables, the factors Group (levels: GL vs. Regular vmbo) and Gender (levels: Male vs. Female), and the covariate General cognitive ability test score was carried out.

Next, to examine possible differences between the various GL institutes in terms of students' learning performance, a MANCOVA with the 4 exam scores (NL, ENG, MATH, and BIO) as dependent variables, the factors GL Institute (levels: 3 different GL institutes) and Gender (levels: Male vs. Female), and the covariate General cognitive ability test score was done.

3 Results

No significant differences in learning performance (i.e., mean vmbo final exam scores) were found between GL students and comparable regular vmbo students: the main effect of the factor Group was not significant ($F(4,269)=0.67$; $p=0.61$) (see also Table 1). Moreover, no significant interaction effects between Group and Gender and/or General cognitive ability test score could be determined. Not surprisingly, General cognitive ability test score appeared to be a significant predictor of vmbo final exam score ($F(4,269)=10.82$; $p\leq 0.001$).

Table 1: Mean vmbo final exam scores of GL students and comparable regular vmbo students for the subjects Dutch language (NL), English language (ENG), Mathematics (MATH), and Biology (BIO).

	NL	ENG	MATH	BIO
GL	6.39	6.34	6.63	6.65
vmbo	6.53	6.69	6.76	6.60

Moreover, no significant differences in learning performance were found between students from the three GL institutes either: the main effect of the factor Group was not significant ($F(8,256)=0.60$; $p=0.78$) (see also Table 2). Moreover, no significant interaction effects between GL Institute and Gender and/or General cognitive ability test score could be determined. Again, General cognitive ability test score appeared to be a significant predictor of vmbo final exam score ($F(4,127)=3.50$; $p\leq 0.01$).

Table 2: Mean vmbo final exam scores of students from the three GL institutes for the subjects Dutch language (NL), English language (ENG), Mathematics (MATH), and Biology (BIO).

	NL	ENG	MATH	BIO
Institute 1	6.49	6.41	6.51	6.85
Institute 2	6.29	6.12	7.07	6.63
Institute 3	6.32	6.64	6.03	6.20

4 Preliminary conclusions

With respect to the first research question, GL students and comparable vmbo students (i.e., the upper category of regular vmbo students when their general cognitive ability level is concerned) did not appear to differ in learning performance in terms of mean vmbo final exam scores for the four selected subjects, which constitute the core of their respective educational programmes. At this point, however, it should be noted that, on average, GL students take their vmbo final exam in most subjects one year earlier than regular vmbo students (after three years instead of four years) because of the acceleration of the vmbo learning trajectory in the GL programme. The only exceptions in this regard are the subjects Biology at Institute 1 and Mathematics at Institute 2, for which the vmbo final exam is in the fourth year. Therefore, the main conclusion regarding students' learning performance is that the acceleration in GL does not negatively affect the students' learning performance (at least, in the first part of the learning pathway, which was examined in the present study).

Moreover, related to the second research question, students from the various GL institutes did not appear to differ in terms of learning performance in the first part of the learning pathway either. In other words, the different GL variants with their respective educational formats did not lead to significant differences in learning performance.

Conclusions with respect to the other four research questions will be presented at the conference. Future research in the context of this project will focus on: 1) analysis of students' study careers in the different learning pathways; 2) analysis of students' learning performance in the second part of their learning pathways; and 3) analysis of students' experiences in higher vocational education.

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