International Journal for Research in Vocational Education and Training (IJRVET)
2024, Vol. 11, Issue 3, 368–395
https://doi.org/10.13152/IJRVET.11.3.3

Learning Pathways in Dutch VET Compared in Terms of Curriculum Design Aspects and Students' Acquired VET Diplomas and Transitions to Higher VET Levels

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Received: 16 June 2023, Accepted: 06 March 2024, Published: 03 June 2024

Abstract

Purpose: During the last decade, new continuing learning pathways have been designed and implemented in the Dutch Vocational Education and Training (VET) column aiming to foster students' transitions between successive educational levels. Prototypical examples of such continuing learning pathways are the Green Lyceum (GL) and the Technical Talent Development programme (TTD). In the present exploratory study, GL and TTD were compared in terms of curriculum design aspects and students' acquired VET diplomas and transitions to higher VET levels.

Methods: Ten curriculum design aspects of GL and TTD were described through curriculum description forms and focus group discussions to be able to determine similarities and

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ISSN: 2197-8646
https://www.ijrvet.net

differences between both learning trajectories. Moreover, acquisition of VET diplomas and transitions to higher VET levels of students from both programmes were compared.

Findings: The ultimate goal of GL was to promote student transitions to higher professional bachelor (HBO) programmes while TTD mainly intended to increase student numbers in the technical domain at the secondary VET level. For GL, a new and integrated VET curriculum was built with specific ingredients to prepare students for the HBO level. For TTD, the contents of the regular VET programmes were roof tile stacked in an accelerated curriculum with a stronger focus on vocation-oriented assignments in the technical domain.

Conclusion: If the ultimate goal of a continuing learning pathway is to promote students' transitions to higher VET levels, curriculum design aspects as represented in GL seem more effective. However, if the focus is on promoting students' diploma acquisition at lower VET levels for specific sectors, curriculum design aspects as represented in TTD seem more effective.

Keywords: Learning Pathway, Learning Trajectory, Curriculum, Diplomas and Transitions, Vocational Education and Training, VET

1 Introduction

An important goal of educational policy in the Netherlands and in many other countries is to increase student numbers in the higher levels of the Vocational Education and Training (VET) system and to prevent student drop-out between successive VET levels. A higher educational level of VET graduates is considered essential for young professionals to be able to deal with the rapidly changing demands of the labour market and of society as a whole (Organisation for Economic Co-operation and Development, 2010). Traditionally, students' transitions from one educational level to the next have been characterised by high student drop-out rates with high personal and societal costs as a consequence (Aarkrog et al., 2018; Social and Cultural Planning Agency, 2016; Van den Berg, 2013). A crucial underlying cause for transition problems in VET is the absence of curriculum continuity and integration of successive educational levels (Biemans et al., 2020a). In other words, because VET curricula at successive educational levels are not truly aligned and integrated, many students face difficulties during their transitions between VET levels, with high drop-out rates as a result (see also Catterall et al., 2014; Harris & Rainey, 2012). As a consequence, changes or adaptations in the design of VET curricula seem crucial to tackle students' transition problems and reduce drop-out rates.

But what kinds of changes and adaptations in VET curriculum design should be made to achieve these goals and to promote students' acquisition of VET diplomas and transition to

successive VET levels? Up until now, the international literature on VET curriculum design has not provided clear answers yet (see also Aarkrog et al., 2018; Biemans et al., 2020a). To address these questions, we introduce the concept of continuing learning pathways and describe two of these VET tracks central to this study.

During the last decade, new continuing learning pathways have been designed and implemented in the Dutch VET column and in education systems worldwide that are aimed at promoting students' acquisition of VET diplomas and fostering their transitions to higher VET levels (see e.g., Sneyers & De Witte, 2016). Continuing learning pathways can be defined as sequential educational programmes combined into a new (integrated) educational programme characterised by curriculum continuity and encompassing more than one qualification level (Biemans et al., 2013). In this way, so-called competence progression models for specific content domains can be implemented to ensure students' continuing competence development. For example, Lilleväli and Täks (2017) elaborated on the concept of a competence progression model within the context of entrepreneurship education (EE) as a step-by-step advancement in various contexts and with learning outcomes and roles of EE throughout the education system (see also Lackéus, 2015; Rasmussen & Nybye, 2013). The aim of these learning pathways (or learning trajectories or learning tracks) is to ensure students' continuing competence development and to reduce existing barriers between successive educational levels (cf. Brockmann et al., 2008).

Examples of such continuing learning pathways in Dutch VET are the Green Lyceum (GL), which is offered by several agricultural (or green) VET institutes and the Technical Talent Development programme (TTD) in the technical domain (see for other examples Imandt et al., 2016). These educational programmes can be described as accelerated and integrated learning pathways encompassing successive VET levels and are specifically aiming at students who combine a relatively high cognitive learning ability to reach the higher professional bachelor (Hoger BeroepsOnderwijs or HBO) level with a clear affinity for practical, vocation-oriented assignments (cf. Jäppinen & Maunonen-Eskelinen, 2012). This Dutch trend of designing and implementing continuing learning pathways is in line with the efforts in many other countries to design more aligned pathways to higher education and, thus, to promote students' transitions between successive educational levels (see e.g., Biemans et al., 2016; 2019; Catterall et al., 2014; Harris & Rainey, 2012).

In the present exploratory study, the learning pathways GL and TTD were described and compared in terms of curriculum design aspects, on the one hand, and students' acquired VET diplomas and their transitions to higher VET levels on the other, to identify possible critical success factors of the two educational programmes. The research aimed to explore how students' acquisition of VET diplomas and their transitions to higher VET levels could be promoted through continuing learning pathways with specific curriculum design features.

In the next section, background information on the programmes GL and TTD will be provided in more detail. After that, the theoretical framework with respect to the key variables in the present study will be described, followed by the methodology and results. In the last section, findings of the study will be discussed and recommendations for future research and educational practice will be presented.

2 The GL and TTD Programmes as Examples of Continuing Learning Pathways in Dutch VET

In the Netherlands, the country in which the present research was carried out, HBO programmes (or higher vocational education programmes, as these are called in Dutch) are being offered by universities of applied sciences. The name of these HBO institutes already indicates the nature of the particular educational programmes that are being offered to the students. These higher professional bachelor programmes can be characterised as building on scientific insights, with a strong focus on application of competencies in professional contexts. HBO graduates, in other words, should be able to analyse specific professional contexts and, at the same time, to act accordingly and efficiently in practical, vocation-related situations (Biemans et al., 2020a). In the Dutch education and training system (Cedefop, 2016; see Fig. 1), two different traditional pathways exist to HBO programmes at European Qualification Framework (EQF) levels five (i.e. Associate Degree) or six (Professional Bachelor): 1) The VET route and 2) the general secondary education route.

The VET pathway starts from lower secondary pre-vocational school-based programmes at EQF level two (Voorbereidend Middelbaar BeroepsOnderwijs or VMBO; nominal duration four years) and goes via middle-management VET programmes at EQF level four (Middelbaar BeroepsOnderwijs or MBO; three to four years) to higher professional bachelor programmes at EQF levels five or six (HBO; two to four years). The second route to HBO concerns the integrated lower and upper general secondary education programmes at EQF level four (Hoger Algemeen Voortgezet Onderwijs or HAVO; five years). The VET route to HBO normally takes seven to eight years, while the nominal duration of the general secondary education programme leading to HBO is five years. The general secondary education programme (HAVO) is mainly theoretical by nature while the VET pathway (Voorbereidend Middelbaar BeroepsOnderwijs - Middelbaar BeroepsOnderwijs or VMBO-MBO) has a strong practical and vocational orientation. For the particular (and substantial) category of students mentioned in the Introduction (i.e. students with high cognitive potential and vocation-oriented focus), however, both pathways can be suboptimal because of a mismatch of the curriculum content and design with the students' capacities, preferences, and motivation: The HAVO pathway lacks vocational orientation, while the VET route is less challenging from a theoretical perspective. The column on the right in Fig. 1

shows the route from pre-university education (Voorbereidend Wetenschappelijk Onderwijs or VWO) to academic (university) education (Wetenschappelijk Onderwijs or WO).

To meet the specific needs of these students, new continuing learning pathways encompassing VMBO and MBO levels in accelerated programmes have been designed and implemented in the VET sector, such as the Green Lyceum (GL) and the Technical Talent Development programme (TTD). Both programmes have been developed and implemented independently from each other and can be considered as prototypical examples of continuing learning pathways in Dutch VET, as they were one of the first Dutch continuing learning trajectories and have been a source of inspiration for many other related initiatives. As explained below, both programmes have similarities, but also clear differences in terms of curriculum design. As such, they represent two different types of continuing learning pathways in Dutch VET (see the descriptions of both programmes below). As shown in Figure 1, these continuing learning pathways concern educational programmes at the secondary level for students in the age of 13-20 leading to HBO programmes at the tertiary level and should not be confused with adult learning programmes.

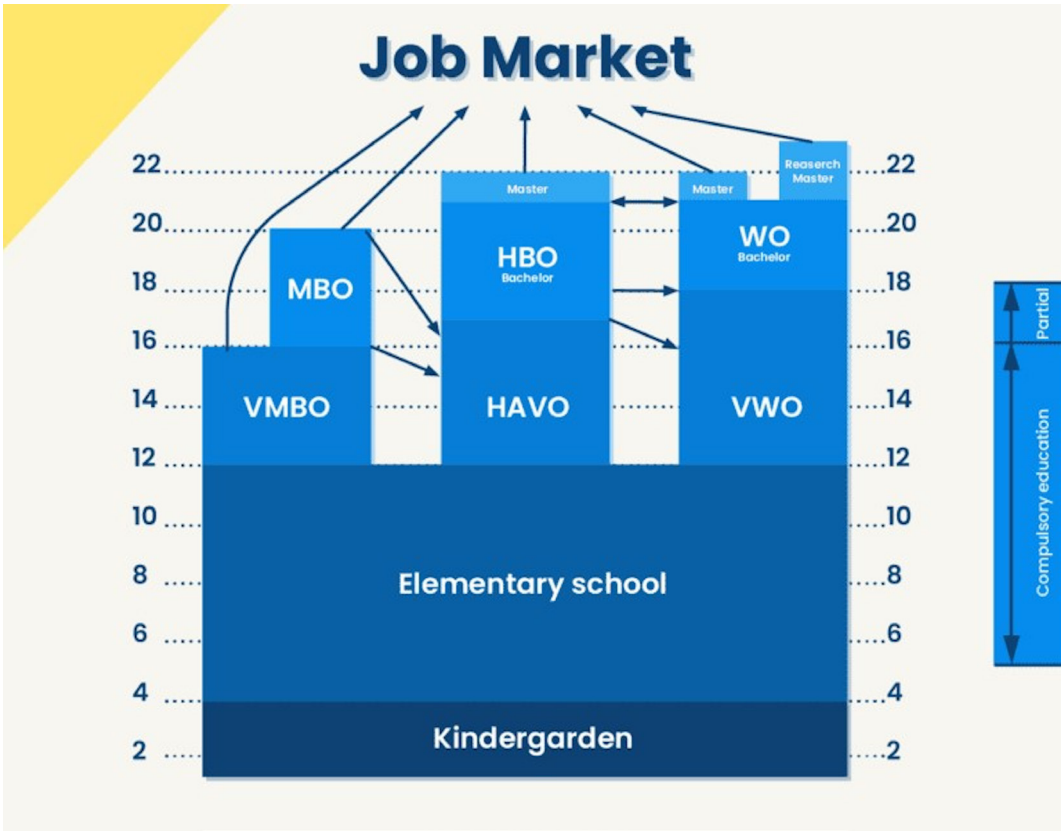

Figure 1: Education System in the Netherlands (Elab Education Laboratory, 2023)

Although both trajectories are comparable in terms of target group and goal of the trajectory (providing accelerated learning routes to students with optimal opportunities to reach the HBO level in an efficient way), curriculum design aspects of these learning trajectories have never been examined in a systematic way (see also Kuijpers et al., 2011), nor related to students' acquired VET diplomas and transitions to higher VET levels. Therefore, in this study, the focus is on examining curriculum design aspects of these particular two programmes and students' acquired VET diplomas and transitions to higher VET levels. In this section, background information on these two programmes will be provided first.

The Green Lyceum (GL) programme was designed as a new curriculum and implemented as one of the first continuing learning pathways in Dutch VET in 2007 and is now offered by several agricultural (or green) VET institutes in the Netherlands, which prepare for a variety of jobs in the agrifood sector. In this study, we focus on the GL as offered by the VET institute Terra in the Northern part of the Netherlands in the locations Emmen and Meppel. GL can be described as an accelerated learning trajectory in which the VMBO programme and the MBO programme at EQF four level are integrated in the sense that certain MBO components are already offered in the VMBO phase (see also Harbers & De Jong, 2017). Because of this integration and acceleration of VMBO and MBO, GL has a nominal duration of six years (instead of the seven to eight years of regular VMBO and MBO programmes in succession (see also Fig. 1). Throughout the whole program, theoretical and vocation-oriented assignments are combined. The GL was designed to prepare students for a transition to a broad variety of HBO programmes after successful completion of the GL trajectory with a regular MBO EQF four diploma. Theoretical embedding of continuing learning pathways in VET in general and more detailed information on the GL programme in particular have been provided in previous publications (see Biemans et al., 2013, 2016, 2019, 2020a; Van der Meijden et al., 2020).

The Technical Talent Development (TTD) programme was designed and implemented as a continuing learning pathway in 2012 in the region Drechtsteden-Gorinchem in the South-Western part of the Netherlands. The TTD programme has a focus on the technical and technological domain with specific tracks in engineering, construction, and information technology. The aim of the TTD programme was to offer promising VMBO students with clear capacities and an affinity for the technical domain an accelerated VET learning trajectory of six years (three years VMBO and three years MBO) instead of the regular eight years (four years VMBO and four years MBO) towards HBO level. The TTD programme can be characterised as a challenging vocation-oriented trajectory, in which students already at VMBO level are confronted with technical assignments that require problem solving at the MBO level. The programme claims to offer a smooth and gradual transition from VMBO to MBO and from MBO to HBO. The original objective (Da Vinci

College, 2014) was that 80% of the TTD students would continue their study career at HBO level after obtaining their MBO diploma (while the remaining students would enter the labour market). The TTD programme has been described in more detail by Van der Meijden et al. (2020).

3 Theoretical Framework

In the following sections, the theoretical background of the curriculum design aspects and students' diplomas and transitions as studied in the present research will be described.

3.1 Curriculum Design Aspects Related to Student Learning

The new continuing learning pathways in the Dutch VET column are characterised by different combinations of curriculum design aspects. This diversity in aspects of curriculum design is due to the fact that these curricula have been developed bottom-up by the particular schools involved without many guidelines from national governmental organisations. To be able to examine the curriculum design aspects of the learning trajectories in the present study, the theoretical framework on curriculum design developed by Van den Akker (2006) and Thijs and Van den Akker (2009) was used. In line with Taba (1962), these authors see the curriculum as the outline for student learning. Organizing student learning ideally starts with determining the particular learning objectives and learning content. The goals and content of learning affect other aspects of the learning plan for students as well. After the design of curriculum, it is implemented in practice and experienced by the students.

In this respect, the distinction made by Billett (2006) between the intended curriculum, the enacted curriculum, and the experienced curriculum should be taken into account (see also Van den Akker et al., 2010). The intended curriculum comprises the identification and sequencing of student learning activities that represent the course to be run based on the specified learning goals (what is intended to occur). The enacted curriculum is the curriculum as it is realised in educational practice (what has actually happened). Finally, the experienced curriculum is the curriculum as experienced by the students themselves (what students experience, construct, and learn). In the present study, the focus is on the intended curriculum, i.e. the aim of the study was to analyse the curriculum of GL and the curriculum of TTD as described by the responsible staff.

In their curriculum design theory, Thijs and Van den Akker (2009) formulated 10 questions closely related to crucial aspects of student learning and corresponding with particular curriculum design aspects. These 10 questions and the corresponding curriculum design aspects are:

1. Towards which goals are they learning? – Aims and objectives
2. What are they learning? – Content
3. How are they learning? – Learning activities
4. How is the teacher facilitating their learning? – Teacher role
5. With what are they learning? – Materials and resources
6. With whom are they learning? – Grouping
7. Where are they learning? – Location
8. When are they learning? – Time
9. How is their learning assessed? – Assessment
10. Why are they learning? – Rationale

The interrelationships of the 10 curriculum design aspects can be visualised in the so-called Curricular Spider Web Model (Biemans et al., 2020b; Thijs & Van den Akker, 2009; Van der Laan & Bron, 2018) (see Fig. 2). Figure 2 shows that all student learning-related questions are connected and correspond with the 10 curriculum design aspects. By analysing the curriculum design aspects of GL and TTD, we aimed to gain insight into key features of these learning trajectories as described by the responsible staff (the intended curriculum) (Billett, 2006). Consequently, by determining similarities and differences between both learning trajectories in curriculum design, the 10 curriculum design aspects of the GL and TTD programmes shed light on the relation with student learning.

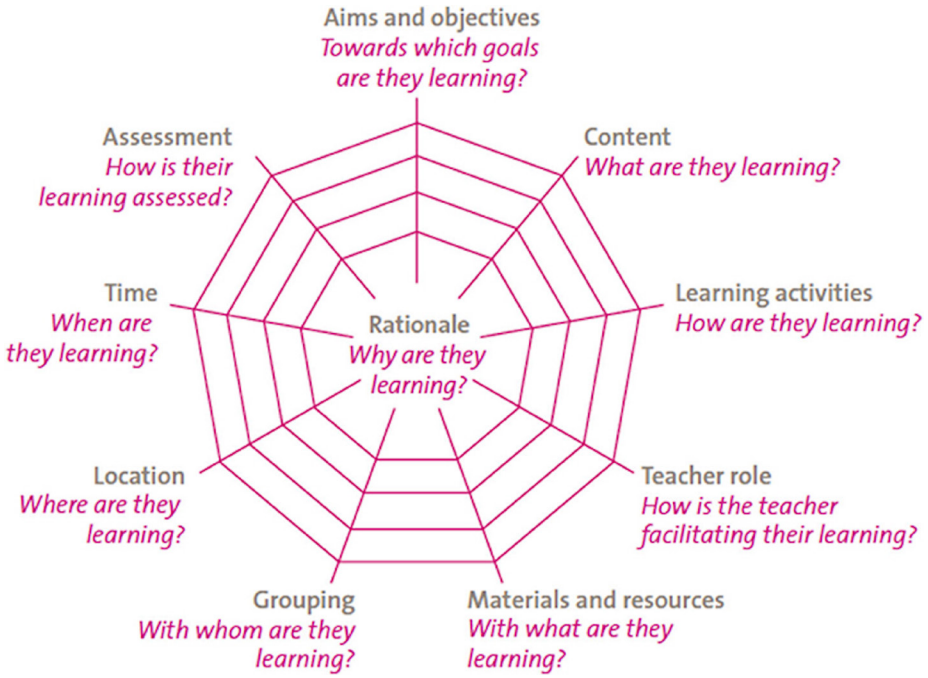

Figure 2: The Curricular Spider Web Model (Biemans et al., 2020b; Thijs & Van den Akker, 2009)

3.2 Students' Acquired VET Diplomas and Transitions to Higher VET Levels

In addition to the curriculum design aspects of the GL and TTD programmes, the present study also focused on acquired VET diplomas and transitions to higher VET levels of students in both trajectories, which was in line with two previous studies on the effects of the GL programme (see for more details Biemans et al., 2016; 2019). As explained in the Introduction section, the GL and TTD programmes can be described as accelerated and integrated learning pathways encompassing VMBO and MBO levels. After completing these programmes, students' can decide to continue their study career at the HBO level or to enter the labour market.

In the first of these studies (Biemans et al., 2016), acquired VET diplomas and transitions to the next VET level of students in the first (VMBO) phase of their GL programme were compared with those of regular VMBO students. To be able to make this comparison, both groups were matched in general cognitive ability level, institute/region, gender, and VMBO examination year. In this study, these variables were operationalised as 1) the percentages of students who either did or did not obtain a VMBO diploma without delay and 2) the percentages of students who either did or did not proceed their study career at MBO level. The

percentages of students who either did or did not obtain a VMBO diploma appeared to be comparable in both groups. On average, however, GL students did their VMBO final exam in most subjects one year earlier (after three instead of four years) than regular VMBO students because of the accelerated GL programme (see also Harris & Rainey, 2012; Hoelscher et al., 2008; Jäppinen & Maunonen-Eskelinen, 2012). Moreover, the percentage of GL students that proceeded their study career at MBO level after obtaining their VMBO diploma appeared to be significantly higher.

In the second study (Biemans et al., 2019), the focus was on the acquired VET diplomas and transitions to the next VET level of students in the second (MBO) phase of their GL programme compared with those of a matched group of regular MBO students. In this case, these variables were operationalised as 1) the percentages of students who either did or did not obtain a MBO diploma at the highest level (EQF level four) without delay and 2) the percentages of students who either did or did not proceed their study career at HBO level, the ultimate aim of continuing learning pathways such as the GL (see also Bradley et al., 2008; Catterall et al., 2014; David, 2010). GL students more often obtained a MBO diploma without delay than the regular MBO students, while regular MBO students even had more nominal time to finish their programme than GL students because of the acceleration of the GL trajectory. Moreover, former GL students more often proceeded their study career at HBO level than comparable students from regular MBO.

To summarize the findings of the two above-mentioned studies, the GL programme appeared to be more effective in terms of students' acquired VET diplomas and transitions to higher VET levels than regular VMBO and MBO programmes. In other words, this learning trajectory was successful as a continuing learning trajectory in reducing students' transition problems between successive educational levels and in stimulating their upward educational mobility in the VET column towards the HBO level. At this point, the specific target group of the GL programme (ambitious students with a relatively high cognitive ability level combined with a practical, hands-on mentality) should be taken into account. This effectiveness of the GL programme could be related to particular curriculum design aspects of the learning trajectory, but this assumption would require additional research. This is precisely the focus of the present study. By comparing GL with another continuing learning pathway, i.e. TTD, we want to gain insight into specific characteristics of these programmes, differences and similarities between these trajectories, acquired VET diplomas, and transitions to higher VET levels. At this point, it should be noticed that, in the present study, we only focus on outcomes of student learning, not on the learning of the students itself (the learning processes).

3.3 Aim and Research Questions of the Present Study

This study aimed to provide answers to the following research questions:

- What are the most important similarities and differences between the GL programme and the TTD programme in terms of curriculum design aspects?

- To what extent do the GL programme and the TTD programme support students' acquisition of VET diplomas and transitions to higher VET levels?

Based on the answers to these research questions, it will be discussed how differences in acquired VET diplomas and transitions to higher VET levels of students from these two learning trajectories in the VET column might be related to differences in curriculum design aspects between both programmes. While we understand that the number of diplomas and transition data are certainly not a direct causal consequence of the curriculum designs, the differences in acquired diplomas and in transitions to higher VET levels provide indications of the extent to which the goals of each pathway are achieved, which can possibly be explained by differences in curriculum design. In sum, it may offer a more nuanced view of the effectiveness of the curriculum design with respect to the original objective: A smoother progression to HBO.

4 Methodology

In the next sections, the methodology of the present study will be explained.

4.1 Curriculum Design Aspects: Data Collection and Analysis

To map the curriculum design aspects of the GL and TTD curricula as perceived by the responsible staff, two methods were used: 1) A curriculum description form according to the Curricular Spider Web Model and 2) focus group discussions. Several procedural steps were taken to collect data on the curricula. In the first step, participants were the GL and TTD project leaders, team leaders, and teachers of the particular schools involved in the respective trajectories who had already been carrying out the particular curriculum for several years in practice. They were invited to complete the curriculum description form for the specific educational programme in their own school (see Table 1). After completion, this form contained a systematic description of the 10 components of the Curricular Spider Web Model (see also Thijs & Van den Akker, 2009; Van den Akker, 2006; Van der Laan & Bron, 2018). In line with the Theoretical Framework, these questions were related to the following design aspects

of the curriculum: Rationale, aims and objectives, content, learning activities, teacher role, materials and resources, grouping, location, time, and assessment. Participants were requested to back up their answers with factual information and data to promote objectivity. The questions in the curriculum description form had to be answered by the participants based on available information sources such as documents, log books, observations, self-reports, lesson plans, information from students, etc. In addition to answering these questions, participants had to specify quantitative data related to these curriculum aspects as well (e.g., intended and actual number of students per class, teacher-student ratio, numbers of hours and weeks, proportion of learning in school and out, etc.). If considered to be relevant, respondents could also add other curriculum design information concerning the particular programme. Finally, if necessary, participants received procedural support from the researchers in order to be able to deliver a complete curriculum description. It took about one to two hours of time to complete the form and send it back (by email) to the researchers.

Table 1: Components and Corresponding Questions of the Curriculum Description Form

Components	*Explanation and corresponding questions*	*Description*
1. Rationale - Why are they learning?	Describe what is intended in the particular programme and why: – Based on what motives, developments or pedagogical and didactical vision is the education in this programme designed? – In what way is the vision of the school expressed in the education in this programme?	
2. Aims and objectives - Towards which goals are they learning?	Describe what should be achieved in the programme: – What goals does the school aim to achieve with this programme? – What should students know and be able to do after this programme?	
3. Content - What are they learning?	Describe what will be learned: – What do students learn in this programme? – What subject content takes a central position? – What skills should be acquired?	
4. Learning activities - How are they learning?	Describe the learning activities of the students in this programme: – How do students learn and work in this programme? – What concrete learning tasks/activities do the students perform to achieve the desired learning goals?	
5. Teacher role - How is the teacher facilitating their learning?	Describe the roles that teachers (and other supervisors) fulfil to support acquisition of the intended knowledge and skills (e.g., content expert, coach, pedagogical expert).	
6. Materials and resources - With what are they learning?	Describe the materials and resources that are used in this programme.	
7. Grouping - With whom are they learning?	Describe the methods for grouping students to develop knowledge and skills in this programme: – With whom does the learning take place? – Does the student learn by him-/herself or does the learning take place in smaller or bigger groups?	
8. Location - Where are they learning?	Describe the learning environment in which knowledge and skills are developed in this programme: – Where does the learning take place? – How is the design of the physical and digital learning environment? – What tools are used to stimulate and support learning?	

9.	Time - When are they learning?	Describe when the learning of knowledge and skills takes place: – When does learning take place? – How much learning time is foreseen? – To what extent can students make choices themselves regarding time investment or learning pace?
10.	Assessment - How is their learning assessed?	Describe how it is assessed in this programme whether the learning goals have been achieved: – How is determined in what learning outcomes the learning has resulted? In what way is the development of knowledge and skills determined/ assessed?

In the second step, focus group discussions were held (one for GL and one for TTD), in which four to five educationalists of the respective programme participated (the team leader, the project leader of the trajectory and two or three teachers). They were further questioned about the curriculum design aspects of the particular educational programme and the underlying argumentations (how was a certain aspect realised and why was this done this way?). Moreover, unclarities in the curriculum description forms were discussed to be able to construct an optimal description of the actually implemented GL and TTD curricula (see also Thijs & Van den Akker, 2009; Van den Akker, 2006). The focus group discussions took place at the respective schools, were recorded, and lasted about 60 to 90 minutes.

The focus group discussions were transcribed and analysed together with the curriculum description form of the specific curriculum (GL or TTD). This was done through thematic analysis. For each of the 10 curriculum design aspects of the Curricular Spider Web Model, the corresponding data from the curriculum description form and associated focus group discussion excerpts were collected and summarised by the two researchers who had facilitated the focus group discussions. For this purpose, two rounds of analysis were organised. First, the thematic analysis was done by the researcher who was least familiar with the specific programme, to maximize objectivity in identifying relevant features of the programme. Second, the other researcher also checked the identified features and added missing characteristics based on the forms. In this way, each curriculum design aspect of GL and of TTD was described in terms of the most crucial characteristics, as mentioned by the participants.

Next, the completed descriptions of GL and TTD were analysed by the two researchers to identify similarities and differences in curriculum design aspects between both programmes. Identified similarities and differences were then discussed by the two researchers, resulting in higher reliability. Finally, the identified similarities and differences were presented to the contact persons of both programmes for validation purposes.

4.2 Students' Acquired VET Diplomas and Transitions to Higher VET Levels: Data Collection and Analysis

As mentioned above, in the present study, similarities and differences in curriculum design aspects between the two programmes GL and TTD were related to students' acquired VET diplomas (to what extent do students finish their educational programme with a VMBO and a MBO EQF level four diploma?) and their transitions to higher VET levels (how do students progress in their education and do they reach the HBO level?) (cf. Bathmaker & Thomas, 2009). At this point, it should be noted that both educational programmes differed with regard to the availability of its data, either in local databases of the particular schools or in the national student database called Register OnderwijsDeelnemers (ROD) (see for more information on data availability Table 2). Because of these differences in data availability (TTD students do not have a specific label in the ROD database like GL students; for GL students, school data from the two GL locations were used to check the national ROD data), statistical comparisons between both programmes were not possible and the choice was made to opt for a more contemplative comparison of acquired VET diplomas and transitions to higher VET levels of students from both trajectories. Moreover, as the two programmes GL and TTD appeared to differ in many curriculum design aspects (see Results section), a direct statistical comparison of the two trajectories would have been less appropriate.

Table 2: Data Sources and Availability for Students' Acquired VET Diplomas and Transitions to Higher VET Levels

Variable	*GL (two student cohorts)*	*TTD (three student cohorts)*
Acquired diplomas (V)MBO	ROD data and school data	School data
Progress in programme	ROD data and school data	School data
Transition to HBO	ROD data	No data available

5 Results

In the following sections, the results of this study will be presented.

5.1 Curriculum Design Aspects Related to Student Learning

The most important similarities and differences between the GL programme and the TTD programme in terms of curriculum design components are described in Table 3 and Table 4.

These curriculum design characteristics were derived from the curriculum description forms and the focus groups, as described in the Methodology section.

Table 3: Main Similarities Between GL and TTD in Terms of Curriculum Design Components

Components	*GL & TTD*
1. Rationale - Why are they learning?	– Attuned to the characteristics of a specific target group (i.e., students with high cognitive potential and vocation-oriented focus) – Originally aimed at promoting transition to HBO
2. Aims and objectives - Towards which goals are they learning?	– After six years students can finalize their VMBO-MBO trajectory – Career orientation and guidance is crucial
3. Content - What are they learning?	– Content requirements of regular VMBO and MBO EQF level four diplomas – Acceleration and deepening of the regular VMBO-MBO trajectory – Explicit attention for study skills (e.g., planning, presenting, cooperating, researching)
4. Learning activities - How are they learning?	– Relatively high degree of independent learning by students – Mix of listening to direct instruction and active learning in interaction – Projects across subject domains
5. Teacher role - How is the teacher facilitating their learning?	– Teachers have different roles but are more guiding than instructing – Mentoring of individual students – Some teachers are responsible for general theoretical subjects, others for vocation-oriented parts
6. Materials and resources - With what are they learning?	– Both traditional and digital materials and resources are used
7. Grouping - With whom are they learning?	– Education is organised in classes, groups, and on individual basis – Bigger projects are done in groups
8. Location - Where are they learning?	– Variety of learning environments (e.g., classrooms, practicals, digital learning environments, learning square, individual coaching) – Vocation-oriented learning outside school
9. Time - When are they learning?	– Official duration of the programme is six years (instead of the regular seven to eight years)
10. Assessment - How is their learning assessed?	– Combination of formative and summative assessment – Evaluation moments during the trajectory – Many projects are completed with a presentation

As shown in Table 3, both programmes had a comparable target group (students with high cognitive potential and a vocation-oriented focus) and the same original goal (promoting students' transition to HBO) and both aimed to accelerate and deepen the traditional VMBO-MBO pathway with the same official diploma requirements. These similarities in original goal and rationale of GL and TTD were reflected by students' learning activities in both programmes: High degree of active and independent learning, projects across subject domains, and explicit attention for career orientation and guidance. To support students' learning, teachers were more focused on guiding and mentoring than on instructing, and there was a broad variation in learning materials and learning environments, both in and outside school.

Table 4: Main Differences Between GL and TTD in Terms of Curriculum Design Components

Components	*GL*	*TTD*
1. Rationale - Why are they learning?	– Aimed at preparing students for HBO in the full spectrum of vocational sectors – General theoretical subjects combined with vocation-oriented parts in which VMBO and MBO are truly integrated – Focus on competence development in broad range of content domains	– Aimed at increasing student numbers in the technical domain – Accelerated regular VMBO-MBO trajectory in which VMBO and MBO partly overlap to promote transition – Focus on attuning content-specific assignments at different educational levels
2. Aims and objectives - Towards which goals are they learning?	– General aim is to promote transition to HBO in variety of domains – Connecting learning content to interests and motivation of the individual student	– During the years, transition to HBO has become a less prominent goal – Connecting VET levels in the technical domain
3. Content - What are they learning?	– General theoretical subjects at EQF four level – Focus on general study skills needed in HBO – Integrated content domains	– General theoretical subjects at VMBO level – Focus on practical, vocation-oriented skills – Additional specific (technical) content
4. Learning activities - How are they learning?	– More individual student-centred than content-centred – Differentiation in content and in learning pace	– Students work individually and in groups in technical projects in cooperation with companies – Less differentiation in content and in learning pace
5. Teacher role - How is the teacher facilitating their learning?	– Role of the teacher tends to switch from content expert to coach and mentor	– Role of the teacher is still mainly content expert
6. Materials and resources - With what are they learning?	– For the theoretical subjects, materials from general secondary education at EQF four level are used – For the vocation-oriented subjects, both new and existing materials are used – New materials for career orientation and guidance	– For the theoretical subjects, VMBO materials are used – For the vocation-oriented subjects, mainly existing materials are used – No new materials for career orientation and guidance
7. Grouping - With whom are they learning?	– Average class size: 8 – 27 students – Group composition relatively heterogeneous	– Average class size: 18 – 25 students – Group composition relatively homogeneous (mainly boys)
8. Location - Where are they learning?	– At VMBO level, the proportion of learning outside school is relatively high – Students tend to spend relatively more time on homework	– At VMBO level, the proportion of learning outside school is relatively low – Students tend to spend relatively less time on homework
9. Time - When are they learning?	– Offers the possibility for further acceleration of the trajectory to five years – Number of traditional lesson hours is relatively low	– Offers no possibility for further acceleration of the trajectory – Number of traditional lesson hours is relatively high
10. Assessment - How is their learning assessed?	– Assessment at general secondary education EQF four level for theoretical subjects – Less differences in assessment culture between VMBO and MBO – Students are individually assessed on competence development and progress in career orientation and guidance	– Assessment at VMBO level for theoretical subjects – More differences in assessment culture between VMBO and MBO – Students are not individually assessed on competence development and progress in career orientation and guidance

Nonetheless, as shown in Table 4, differences between the two programmes were found as well and these differences appeared to have become more prominent during the years. First of all, while the aim and rationale of GL have remained the same during the years (promoting students' transition to HBO in a variety of content domains), the focus of TTD has gradually shifted to increasing student numbers in the technical domain at the MBO level (instead of promoting their transition to HBO). For GL, a new and integrated VMBO-MBO curriculum was built with specific ingredients to prepare students for the HBO level (e.g., general theoretical subjects offered at general secondary education EQF four level, extensive attention for study skills needed at HBO, focus on competence development in a broad range of vocation-oriented content domains, and connecting learning content to interests and motivation of the individual student). For TTD, on the other hand, the contents of the regular VMBO and MBO programmes were the starting point for an accelerated curriculum with a stronger focus on vocation-oriented assignments in the technical domain.

This growing difference in aim and rationale is reflected in the learning activities of the students as well. Whereas GL primarily intends to prepare students for HBO programmes in a broad variety of content domains, TTD aims to increase the number of students opting for an educational programme in the technical domain, mainly at MBO level. As mentioned in Table 4, TTD students have a strong focus on practical, vocation-oriented skills in the technical and technological domain. To practice these skills, students often work individually and in groups in technical projects in cooperation with companies, which makes the technical training rather specific and attuned to the labour market. GL students, on the other hand, work on vocation-oriented assignments as well but in a variety of professional contexts and domains.

For GL students, preparation for HBO took a central position as shown by the level of the theoretical subjects, the focus on study skills needed in HBO, and the truly integrated VMBO and MBO content domains. In essence, the GL education programme was aimed at making the students ready for HBO in terms of competences, motivation, study skills, and orientation. Truly integrated VMBO and MBO means that a GL curriculum was designed in which original VMBO and MBO elements were combined into new curriculum parts with corresponding assignments.

In TTD, the original VMBO and MBO programmes basically stayed the same. The only thing that changed was that some MBO elements were offered earlier in the programme, next to VMBO elements (so both were overlapping to some extent). For TTD students, vocation-oriented training in the technical domain at MBO level has become more and more the first priority instead of preparation for HBO. Acceleration of the original VMBO and MBO programmes was still regarded as important but, to a high extent, the original VMBO and MBO learning materials were used and the role of the teacher predominantly reflected the role of a content expert supporting the students in their technical training. Regarding teacher

roles, the most prominent roles in GL were mentoring, coaching and career orientation and guidance, more than the original roles of instructor and content expert. In TTD, these latter two roles were still relatively more important.

When it comes to group composition, TTD student groups are relatively homogeneous (mainly boys), while GL classes are more heterogeneous in terms of student characteristics. Moreover, in TTD, the originally TTD students and the regular MBO students often were combined in the same classes, while in GL, the students followed their educational programme separately from the regular MBO students.

5.2 Students' Acquired VET Diplomas and Transitions to Higher VET Levels

In this section, acquired VET diplomas and transitions to higher VET levels for students from both programmes GL and TTD are presented. In Table 5, students' acquired diplomas and transitions in the GL trajectory are shown (students from the two GL locations Emmen and Meppel are combined). To facilitate a comparison between the GL and the TTD programme, students in study year three are taken as the cohort to measure acquired VET diplomas and transitions to higher VET levels until HBO. As mentioned above, target groups of both programmes were comparable. The same held for the students' age in both groups. When students' acquired diplomas and transitions are concerned, students who followed their programme in the nominal period are combined with students who spent an additional year on the trajectory. In this way, it was possible to include students with some delay in their study programme as well. Table 6 shows students' acquired diplomas and transitions in the TTD trajectory (in this case, student transition data to HBO were not available).

Table 5: Students' Acquired Diplomas and Transitions in the GL Pathway and in the TTD Pathway

	GL		*TTD*	
	N	%	N	%
Study year 3 VMBO	166	100%	59	100%
Study year 4 VMBO	157	95%	56	95%
VMBO diploma	157	95%	53	89%
Transition to MBO	88	53%	53	89%
MBO diploma	83	50%	32	54%
Transition to HBO	71	43%	n/a[a]	

[a] n/a = No official data available

With respect to the GL trajectory, Table 5 shows that, after VMBO study year four, 95% of the GL students had obtained the VMBO diploma. A bit more than half of the GL students (53%), proceeded their trajectory at MBO level within GL. Of these students, almost all (94%)

acquired their MBO diploma in GL (83 out of 88). In total, 50% (83 out of 166) of all students from GL study year three obtained their MBO diploma in the nominal period or the nominal period plus one year. As shown in Table 5, 86% (71 out of 83) of all these GL students who obtained their MBO diploma, proceeded their study career at HBO level. In total, 43% (71 out of 166) of all students from GL study year three went to HBO after finishing the GL.

With respect to the TTD trajectory, Table 5 shows that, after VMBO study year four, 89% of the TTD students had obtained the VMBO diploma. All these students proceeded their trajectory at MBO level. 60% of these students (32 out of 53) acquired their MBO diploma. In total, 54% (32 out of 59) of all students from TTD study year three obtained their MBO diploma in the nominal period or the nominal period plus one year. Official TTD student transition data to HBO were not available, but TTD contact persons indicated that most TTD students entered the labour market after obtaining their MBO diploma and only a minority of them proceeded their study career at HBO level.

A comparison of students' acquired diplomas and transitions in the programmes GL and TTD indicated that:

- The percentages of students who obtained a VMBO diploma were comparable in both programmes (GL: 95% vs. TTD: 89%).
- The percentage of TTD students who proceeded their trajectory at MBO level in the programme is higher than for GL (GL: 53% vs. TTD: 100%): Almost half of the GL students switched to regular MBO programmes or to general secondary education.
- The percentage of GL students who proceeded at MBO level and obtained their MBO diploma in the programme, however, is higher than for TTD (GL: 94% vs. TTD: 60% of the MBO intake numbers).
- In total, the percentages of students who obtained a MBO diploma were comparable in both programmes (GL: 50% vs. TTD: 54%).
- Most former GL students proceeded their study career at HBO level, while most former TTD students entered the labour market.

6 Discussion and Conclusions

The present study showed that, although GL and TTD programmes are aiming at comparable target groups of students (with relatively high cognitive abilities and a preference for vocation-oriented assignments) and both programmes are characterised by an acceleration of the original VMBO-MBO pathway, other curriculum design aspects of the two programmes

are fundamentally different. These differences in curriculum design seem to be related to differences in acquired VET diplomas and transitions to higher VET levels between students from both programmes.

Differences in curriculum design. In this study, several main differences between GL and TTD could be determined. First, both programmes differ in how they are connected to professional contexts (cf. Tynjälä, 2009). GL focused on making the student familiar with several professional contexts to enable them to make a conscious choice for a particular HBO programme. During the years, promoting students' transitions to HBO has become a less prominent goal of the TTD programme, as opposed to GL for which this is still the main objective. In fact, TTD has been increasingly aiming to prepare students for the labour market in the technical domain instead of promoting their transition to HBO. These different starting points of both programmes have consequences for the curricula of the two learning pathways. For GL, VMBO and MBO teachers together have built a new curriculum in close cooperation, while for TTD, the original existing VMBO and MBO programmes are still the core curriculum. As a result, TTD teachers at the VMBO and the MBO level are not tempted to seek strong collaboration.

Second, GL and TTD differ in the extent to which the curriculum prepares for further education at HBO level. GL is explicitly aimed at developing competencies and study skills that students need in HBO (cf. De Bruijn & Leeman, 2011; Christoffels & Baay, 2016) and offers theoretical subjects at the general secondary education EQF four level. TTD, on the other hand, mainly offers the original VMBO and MBO content with a stronger focus on vocation-oriented assignments in the technical domain.

Third, differences between both programmes were found in the way the content of the curricula is organized and the teachers' roles in education. GL is characterized by a continuing learning pathway in which VMBO and MBO are truly integrated, while, in TTD, VMBO and MBO are partly roof tile stacked to shorten the programme and improve the transition between both educational levels and have not changed much compared with the regular VMBO and MBO curricula (Koopman et al., 2011). With regard to the materials, it is also explained that, in general, TTD used the same materials and resources as before while GL developed many new materials and resources for the integrated new curriculum and the preparation for study skills needed in HBO.

In GL, teaching appears to be more attuned to the characteristics of the students (especially more focus on coaching for competence development and less on teaching domain-specific content) than in TTD, in which teacher roles and other educational aspects like materials and resources have not changed significantly. This is also visible in the composition of student groups in classrooms. As a consequence, it was easier for GL to offer their students their unique GL programme, while for TTD students, their programme became more mixed because of the combination with the traditional regular MBO students and their learning

performance became more comparable with regular MBO students as well (as opposed to GL students).

To conclude, the specific vision on education and learning and the different aims of the particular programme have directed the variety in curriculum design and implementation of the continuing learning pathways GL and TTD (cf. Mulder & Cuppen, 2018; Sturing et al., 2011).

Differences in students' acquired VET diplomas and transitions to higher VET levels. Both programmes do not only differ in curriculum design aspects, but also with respect to students' acquired VET diplomas and transitions to higher VET levels. Looking at students' acquired diplomas, GL and TTD still appeared to be comparable, both when it concerned the percentages of students who obtained a VMBO diploma and the percentages of students who received a MBO diploma. However, during the first (VMBO) part of the trajectory, more GL students appeared to leave this programme and to switch to regular MBO programmes or to general secondary education than TTD students. In the second (MBO) phase of the programme, however, it was the other way round: The percentage of GL students who proceeded at MBO level and obtained their MBO diploma in the programme was clearly higher than for TTD. In other words, more students dropped out in the first phase of the GL programme, but if they had decided to proceed with this trajectory, their chances of success were relatively high compared with TTD students. Moreover, after getting their MBO diploma, the vast majority of former GL students proceeded their study career at HBO level, while most former TTD students entered the labour market and did not decide to go to HBO. To conclude, there was more drop-out of students in the first phase of the GL programme than in the TTD programme, but this pattern was reversed in the second phase.

Possible relationships between curriculum design aspects and students' acquired VET diplomas and transitions to higher VET levels. How could these differences in acquired VET diplomas and transitions to higher VET levels of students from the GL and from the TTD programme be related to differences in curriculum design aspects between both programmes? In the following paragraphs, several assumptions about possible relationships between particular curriculum design aspects of continuing learning pathways in VET and students' acquired VET diplomas and transitions to higher VET levels will be formulated.

The present study showed that, originally, both programmes GL and TTD had the same general goal (Da Vinci College, 2014; Harbers & De Jong, 2017): Promoting successful transitions through the VET column to HBO programmes for a specific target group (i.e., students with high cognitive potential and vocation-oriented focus). Relatively quickly, however, the focus of the TTD programme shifted to increasing the number of students in the technical domain at MBO level. This switch in main goal had significant consequences for the curriculum design of TTD compared with GL. As mentioned in the Results section, for GL, a new and integrated VMBO-MBO curriculum was built with specific ingredients to prepare

students for the HBO level (e.g., general theoretical subjects offered at general secondary education EQF four level, extensive attention for study skills needed at HBO (cf. Christoffels & Baay, 2016), focus on competence development in a broad range of vocation-oriented content domains, and connecting learning content to interests and motivation of the individual student). In this regard, GL can be considered as a truly new curriculum, positioned next to the original VET programmes (Van der Meijden et al., 2020). For TTD, on the other hand, the contents of the regular VMBO and MBO programmes were the starting point for an accelerated curriculum with a stronger focus on vocation-oriented assignments in the technical domain. As a consequence, the TTD has been mixed in educational practice with the regular VET programmes offered by the same schools. This makes the specific goals and implementation of TTD more fluid and less focused on the original student target group. The evaluation of the TTD goals shows that the curriculum structure follows the central rationale of a team: Why are students learning? (see also Fig. 2). As such, we conclude that the design of the model by Thijs and Van den Akker (2009) is confirmed by the results of this study; curriculum elements will be adapted to changing views and beliefs about the main aim of the curriculum (which in turn is influenced by changes in the labour market).

These differences in goals (focus on transition to HBO vs. more students in the technical domain) and corresponding curriculum design aspects are reflected in what students learn and why. From their first study year on, the ultimate goal for GL students is going to HBO after their GL programme. Therefore, theoretical subjects are taught at a higher level, various content domains are explored to enable students to make a deliberate choice for a follow-up HBO programme, study skills needed in HBO are fostered, and their focus on and motivation for lifelong development are stimulated. In contrast, TTD students focus on entering the labour market after their TTD programme. These students are immersed in the technical domain and mainly practice their professional skills and competencies, which can encourage them to work in this particular domain. As such, one may conclude that the goals of the two respective programmes are being met in the way students follow the learning trajectory. This makes it clear that this is not a one-sided development of motivation, but a form of mutual adjustment between the preferences of the students on the one hand, and the educational context and the respective teachers on the other hand, who as a consequence organize an appropriate educational programme.

Students' way of learning, again, is reflected in the findings concerning the students' acquired VET diplomas and their transitions to successive VET levels. In our study, a relatively high percentage of GL students left the programme already in the first phase of the trajectory and decided to switch to more traditional programmes in VET (or for some students' general secondary education). At this point, it should be noted that the fact that during the VMBO part of the trajectory, more GL students appeared to leave this programme and switch to regular MBO programmes or to general secondary education than TTD students is not typical

for the GL-programme. According to the Doorstroomatlas VMBO [Mapping Transitions between VMBO and MBO] (Ministry of Education, Culture, and Science, 2012), only 30% of all VMBO learners in the green sector stay in the green sector in MBO; 70% continue their MBO study in another sector (Economy, Health Care, Technology). From this perspective, the fact that 53% of the GL students proceeded their education at MBO level within GL can be considered a success rather than a disappointing outcome of the GL programme. It's a known and stable phenomenon in Dutch VET, one of its explanations being that young students (12 year olds) and their parents prefer the small, safe, and caring green VMBO schools above the larger and anonymous general VMBO schools (Van den Berg, 2013). One can assume that the remaining GL-students made a positive and distinct choice for staying in GL, explaining why almost all of them acquired their MBO diploma and most of them proceeded with a HBO study, which was the ultimate goal of the GL trajectory.

For the TTD programme, the story is quite opposite: There were hardly any drop-outs in the first (VMBO) phase of the programme, but more difficulties with acquisition of the VET diploma in the second (MBO) phase and almost no transition to HBO after finalising the programme. Apparently, these students have more difficulties to keep their motivation for the study programme in the MBO phase. Almost all these students prefer to enter the technical sectors of the labour market after obtaining their MBO diploma. This trend may have been reinforced by job opportunities on the labour market, rather than a negative motivation to continue studying at HBO. This goal can be achieved in less time by following the TTD programme in comparison with the regular VET trajectory (Van der Meijden et al., 2020).

To conclude, the hypotheses derived from the present study that can be tested in future empirical research can be formulated as:

- GL curriculum design aspects are more effective to promote students' transitions to higher levels of the VET column than TTD curriculum design aspects.

- TTD curriculum design aspects are more effective to promote students' diploma acquisition at lower VET levels for specific sectors than GL curriculum design aspects.

To test these hypotheses, future studies should compare more cohorts of GL and TTD students (or cohorts of students from comparable continuing learning pathways). These students should be followed for a longer period of time during their VET careers and in the starting phase of their professional careers. Students who drop out from GL and TTD should be followed as well. Next to examining students' acquired VET diplomas and transitions to higher VET levels, future studies could also focus more on students' learning processes in continuing learning pathways (instead of just studying student learning outcomes). This would make it possible to further examine the effects of particular design characteristics on student learning. Moreover, the effects of separate, potentially relevant curriculum design

aspects could be examined by interviewing students and teachers with respect to the underlying mechanisms of these design aspects.

At this point, it should be noted that differences in acquired VET diplomas and transitions to higher VET levels found between students from GL and TTD might have been caused to some extent by other possible factors beyond curriculum design as well, such as specific student characteristics, demographic and regional factors, preferences of students and parents for particular school types, differences in group composition, as well as teachers' job-orientation and pedagogical content knowledge. As a consequence, at this point, possible relationships between curriculum design aspects of both programmes and students' acquired VET diplomas and their transitions to successive VET levels should be interpreted with care. In future research, this issue could be tackled in related studies by controlling for abovementioned factors, which was not possible in the present study.

This relates to potential selection effects that could have influenced the outcomes of the present study (i.e., students might have been aware about the curricular differences between programmes and choose the programmes based on this knowledge; this would then lead to the effect that degree completion and transitions cannot only be traced back to curricular differences but also to individual differences). At this point, it should be noted again that both programmes were aiming at comparable target groups of students (with relatively high cognitive abilities and a preference for vocation-oriented assignments). However, since the two programmes GL and TTD were offered by schools in different parts of the country, students in reality did not have the choice between these two programmes. Nevertheless, in future research, it would be wise to take into account special individual factors such as motivation and specific interests.

Moreover, it should be recognised that the nature of the data collected in this study was mainly perceptual. It would definitely have added value to study the enacted GL and TTD curricula in the future, e.g., through the analysis of observations or video-recordings of concrete lessons or lesson segments of GL and TTD classes. In this way, it could be verified whether the intended design aspects of GL and TTD as identified in the present study are truly visible in the classroom interactions between teachers and students (cf. Choppin et al., 2022).

Another interesting perspective for future research would be teachers' instructional and pedagogical activities and to focus on the question to what extent they meet the students' needs. As is well known, teachers are among the most powerful influencers of the learning process (Hattie, 2012). And, finally, there is the perspective of the students themselves. In the present study, the focus was on the intended curriculum according to the responsible staff, but this could be different from the curriculum as experienced by the students (Billett, 2006). It would therefore be relevant to investigate whether the students experience the curricula of the two programmes in the same way as the designers and teachers. In this research, other methods such as interviews and questionnaires could be used.

The results of the present study and follow-up research contribute to a stronger scientific body of evidence for effective curriculum design aspects to promote students' successful transitions between various levels of the VET column (see also Van der Meijden et al., 2020). Moreover, effective curriculum design principles derived from this study and related future empirical research could have a clear practical value by providing guidelines for the design and implementation of comparable educational trajectories in order to promote students' acquisition of VET diplomas and their transitions to higher VET levels, both in the Netherlands and abroad (cf. Nägele et al., 2018).

Ethics Statement

Ethical guidelines as specified by the International Journal for Research in Vocational Education and Training (IJRVET) have been taken into account in this research.

Acknowledgement

This research project was funded by Nationaal Regieorgaan Onderwijsonderzoek (NRO) The Netherlands (grant number: 405-17-626).

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