# Welten Institute Research Project Proposal
## External PhD candidate

### 1. Applicant(s)

| Main applicant / Contact person | | |
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### 2. Title and Summary

| Title of the part-project and concise summary of the problem definition (maximum 100 words) |
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| | |
|---|---|
| Title (English): | Student motivation in assessments: A design-based study to enhance student motivation for development-oriented assessments. |
| Title (Dutch): | Studentmotivatie voor toetsen: Een ontwerp-gebaseerd onderzoek om studentenmotivatie voor ontwikkelingsgerichte toetsing te verhogen. |
| Summary: | There is a continuous search for a higher student motivation. One solution for more student motivation has been sought in personalized learning. While a lot of research has been done in the field of motivation and personalized learning, motivation for personalized assessment formats have not been researched extensively.<br>Moreover, little research has been done in the field of personalized learning and assessment within secondary vocational education, especially within technical degree programmes. In this PhD project an assessment cycle will be redesigned to a more personalized assessment format, in order to enhance student motivation for assessments.<br>The main research question is:<br>How can self-determination theory guide the redesign of development-orientated assessments in technical secondary vocational education aimed at enhancing student motivation? |

### 3. Under which line of research of the Welten programme is this application submitted?

| Line(s) of research | Fostering effective, efficient and enjoyable learning (FEEEL)<br>Teaching and teacher professionalization (T2) |
|---|---|

### 5. Duration for which you are applying

| Duration (years) | 5 |
|---|---|
| Starting date | 01-08-2019 |

**8. Research proposal** *(Maximum 4200 words, excl. References)*
*8.1.1 Problem definition*

Compared to other countries, Dutch students are less motivated to engage in complicated assignments and the motivation for their learning tasks will last shorter (Organisation for Economic Co-operation and Development, 2016). Low intrinsic student motivation is the main reason for dropping out of secondary vocational education (Inspectie van het Onderwijs, 2018; Vugteveen, Timmermans, Korpershoek, van Rooijen, & Opdenakker, 2016). As such, the educational system is continually searching for methods to increase student motivation (Kamstra, 2015; Ros, Lieskamp, & Heldens, 2017; Martens, Gulikers, & Bastiaens, 2004; Meusen - Beekman, Joosten – ten Brinke, & Boshuizen, 2016; Van der Steen, 2015). Intrinsically motivated students are more curious, and engage more in deep level learning, which holds true for students of all age groups (Martens et al., 2004). Yet, surprisingly little research has been conducted into students' actual motivation for secondary vocational education and how this is related to the educational context (van der Veen, Weijers, Dikkers, Hornstra, & Peetsma, 2014).

One solution for increasing student motivation is sought in personalized learning. National and international research has been done in the context of personalized learning (Sebba, Brown, Steward, Galton & James, 2007; Leadbetter, 2005). This research speaks of personalized learning if there is an open offer of education, in which students are the owner of their learning process and feel free to make their own decisions, according to their learning process (Coubergs, Struyven, Engels, Cools, & Martelaer, 2013). When students participating in a personalized learning course, they will experience more autonomy (van Loon, 2013), which is considered an important precursor to intrinsic motivation (Ryan & Deci, 2000).

While there are many examples of schools that offer students a personalized learning path, there is less personalization for students concerning assessments. A more personalized format of assessment might, however, contribute to higher student motivation according to the self-determination theory of Ryan and Deci (2000). Wise and Demars (2005) confirm this hypothesis in their review study. Wise and Demars (2005) have reviewed results from 12 empirical studies which compared the assessment results of motivated with less motivated students. The conclusion is, that motivated students perform, on average, more than one-half standard deviation higher than unmotivated students.

*8.1.2 Previous research Self Determination Theory (SDT)*

Enhancing student motivation in the field of personalized assessments is the goal of this study. The term motivation is multi-interpretable and therefore may need clarification. In this research, 'motivation' is defined as "the process whereby a goal-directed activity is instigated and sustained" (Pintrich & Schunk, 2002, p. 5). A widely used theory on motivation is the self-determination theory (SDT) of Ryan and Deci (2000). Ryan and Deci (2000) identify three basic psychological needs to support student motivation: competence, relatedness, and autonomy. The need for competence is the desire to become good at what you learn (Ryan & Deci, 2000). The need for relatedness refers to the need to be loved and cared for by others and to take care of others (Baumeister & Leary, 1995; Ryan & Deci, 2000). The need for autonomy refers to the freedom to act and to be able to make decisions (Ryan & Deci, 2000). According to Ryan and Deci (2000), students should not only have a choice, but they should also feel free to make their own decisions in the learning process. When these three basic needs are met, students will, according to theory, feel more intrinsically motivated.

Depending on the extent to which these three basic needs are fulfilled, students show either amotivation (i.e. when there is no self-determination for the student), extrinsic motivation or intrinsic motivation (when students have full self-determination; see Figure 1). According to the SDT, intrinsic motivation is an innate curiosity which is not learnable, but which can be stimulated by supporting the three basic human needs (Martens, 2015). In that regard, the environment of the learner has to make sure that the propensity to be intrinsically motivated is not disturbed. When students are intrinsically motivated, the learning itself is the motivating factor (Amabile, Hill, Hennessey, & Tighe, 1994; Deci, 1971; van den Broeck, Vansteenkiste, de Witte, Lens & Andriessen, 2009). Ryan and Deci (2000, p. 71) define intrinsic motivation therefore as "doing an activity because of its inherent satisfaction instead of some separable consequences".

Intrinsic motivation is the most self-determined form of motivation. According to the SDT, students have an inherent tendency to seek out novelty and challenges, to extend and exercise their capacities, to explore and to learn (Ryan & Deci, 2000). This urge to develop is the intrinsic motivation that exists within every individual. Because everyone has different life experiences the importance of the needs differs per individual (van den Broeck et al., 2009). Motivation, therefore, can be seen as a personal quality.

Extrinsic motivation, on the contrary, arises from an external source (Amabile et al., 1994; Deci, 1971). It is not the learning process that is perceived as motivating, rather the reward or recognition by others is seen as motivating (Gagné & Deci, 2005). The reward can be materialistic, for instance

receiving a present, but the reward can also be social, for instance, appreciation for the task that has been done (van den Broeck, de Cuyper, Baillen, Vanbelle, Vanhercke, & de Witte. (2013).

Deci and Ryan (2000) are speaking of amotivation when a person is not motivated at all. Amotivation is the state of lacking the intention to act, amotivated students do not act at all or act without intent, they just go through the motions (Deci & Ryan, 2000). Learning will not occur in this stage.

Within the self-determination continuum from amotivation to intrinsic motivation, figure 1, Ryan and Deci (2000) distinguish different motivation and corresponding regulatory styles. A more intrinsic regulation style ensures an enhancing of student motivation.
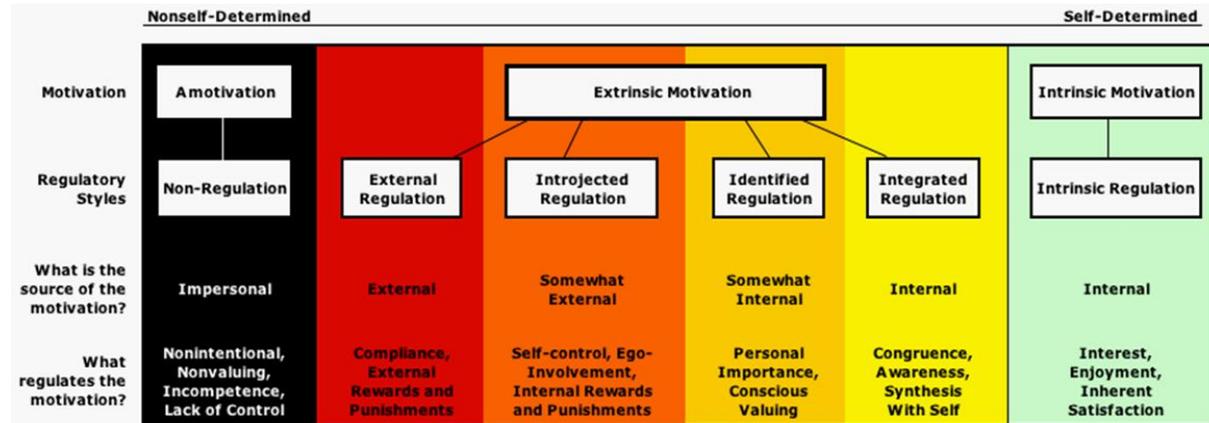


*Figure 1*. The self-determination continuum adjusted from The self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. (p. 72) by Deci & Ryan (2000).

External regulation is the least autonomous type of regulation and arises due to external requirements or potential rewards. Introjected regulation is where students link their self-esteem to the performance of the activity. The students want to avoid guilty feelings or feelings of fear; they want to experience positive feelings such as pride (Assor, Vansteenkiste & Kaplan, 2009). Identified regulation can occur when a behavior or regulation is accepted by students as valuable for themselves (Deci & Ryan, 2000). Students identify themselves with the reason for conducting an activity that is performed, because they find the activity important or useful. The most self-determined form of extrinsic motivation is integrated regulation. With integrated regulation, students have a strong sense that the behavior is an integral part of who they are, that it comes from their sense of self-consciousness and is therefore self-determined. Integrated regulated motivation has many similarities with intrinsic motivation, but it is still extrinsic motivation, because the result that is being pursued lies outside the activity itself (Van den Broeck et al., 2009).

### 8.1.3 Definition of the term 'development-oriented assessment'

The term assessment may need clarification because it is a widely used term with different interpretations. Assessments within secondary vocational education are divided in formative assessments, development-oriented assessments and examination. All three types of assessment have their own purpose within the vocational education system.

Let's start with summative assessment which is also known as examination. An exam is used to determine whether students have passed the acquired level of knowledge, skills or professional attitude (Sluijsmans & Segers, 2018). Summative assessments or exams take place after learning. Summative assessments must be constructed by certified assessment-constructors and this type of assessment must be validated by an examination committee to ensure the quality of the summative assessment. The education inspectorate will check every four years, the quality of the exams and the implementation of exams. The stakes of the assessments are high because the students experience far-reaching consequences from the assessment results, such as whether or not graduating.

At the other end, there is formative assessment which is part of the learning process. Black and Wiliam (1998, p. 2) define formative assessments as "activities undertaken by teachers -and by their students in assessing themselves- that provide information to be used as feedback to modify teaching and learning activities". The results of this type of assessment gives information about the learning process of the student and is not a judgement of the students' performance. The stakes of the formative assessments are low because the assessment results are only used by students and teachers to increase the learning efficiency.

Somewhere between summative- and formative assessment there is development-oriented assessment. In this case, the formative assessments have a summative character (Sluijsmans & Segers, 2018), namely to measure the development of the students' knowledge, skills or professional attitude. Students within a class will take the development-oriented assessment at the same time and under conditioned circumstances (e.g. cheating is made difficult by separating the desks from each other, students have no access to resources and the assessment is taken in silence). The result of this type of assessment is reviewed by the teacher and must meet requirements, composed by the team of teachers, to complete a school period, subject or school year. The stakes of the development-oriented assessments are relatively high, a decision is made based on the assessment results. The development-oriented assessment is not part of the examination program, it is provisory to complete a part of the course. Development-oriented assessments can be composed bij the team of teachers because this assessments are not part of the examination program.

The type of assessment which will be studied in this PhD-project is the development-oriented assessment. The reason to study this type of assessment is because development-oriented assessments can be adjusted and personalized relatively simple by the team of teachers. The stakes (e.g. to complete a school period, subject or school year) of the development-oriented assessment will not be adjusted.

There are many different formats of development-oriented assessments that fit within this study. For example, different types of theoretical assessments, practical assessment, educational learning discussion, reflective journal, concept mapping, poster presentation, internship assessment, (video) report, portfolio or providing workshops for other students.

### 8.1.4 Previous research

A lot of research has been done on student motivation while performing a learning task (e.g. Deci & Ryan, 2000; Ros, Castelijns, van Loon & Verbeeck, 2014). Research done by Reeve and Jang (2006), for example, shows that an autonomous learning environment can promote the intrinsic motivation of students. The transition from the controlled learning environment to the autonomous learning environment ensures that the emphasis shifts from the teacher to the student and thus from instruction to self-regulated learning (Schuit, Vrieze, & Sleegers, 2011). Kamstra (2015) has done a similar study with a different conclusion. Kamstra investigated the effect of the learning environment on perceived autonomy and intrinsic motivation within a series of English grammar lessons. Quantitative data was collected by performing a pre- and post-test, using the Intrinsic Motivation Inventory and Learning Climate Questionnaire. Qualitative data has been collected by observing lesson recordings, to determine whether the intended autonomy-supporting learning environment is being implemented as intended. 43 Secondary school students of the fourth grade spread over two classes participated in this research. The conclusion is that the autonomy supporting environment has no influence on intrinsic motivation, but it has influence on the perceived autonomy by students.

This result can be explained by the finding that, although autonomy and perceived choice can stimulate student motivation, autonomy can also lead to an overload and thereby harming performance. It is thus important to limit the number of options for students when enabling choice. Limited choice leads to better motivation and performance than unlimited choice (Iyengar & Lepper, 2000; Van Loon, 2013). This is also concluded by Cooper, and Robinson (2008) who have performed a meta-analysis on 41 studies that examined the effect of choice on intrinsic motivation. Results indicated that it is better to provide two to four successive choices instead of unlimited choices.

Furthermore, there has been some research on the types of choices that can be offered. Reeve, Hamm and Nix (2003) have made a distinction between 'option choices' and 'action choices'. A 'choice of options' means that the options are limited. A 'choice of action' consists of the possibility of participating in an activity or not. If students are able to choose between A) a multiple choice knowledge-assessment, B) an oral questioning or C) a capability knowledge assessment, then there is an 'option choice'. When students can choose to make the development-oriented assessments or not, than there is an 'action choice'. Reeve et al. (2003) conclude that only 'action choices' influence student motivation.

Despite the interest in SDT in relation to learning tasks, relatively little research has been done on student motivation for and choice in assessments and the research that has been done focuses largely on the relation between motivation and assessment *results* instead of increasing choice and motivation for (taking) the assessment itself or it focuses on characteristics of assessment (e.g., format) and their effect on motivation, but without providing choice.

De Klein, van Look, van Tartwijk, Prins and Lutz (2015) for example have looked into the effects of different testing formats on motivation. They evaluated 10 years of research into test motivation. They conclude that open assessments, such as writing an essay, are more motivating than closed assessments, like multiple choice assessments.

In another study, Dochy, Segers en Sluijsmans (1999) offered choice on the type of assessment: self, peer and collaborative assessment, and the effect on vocational student motivation was measured.

Their conclusion was that self, peer and collaborative assessment formats have a positive influence on student motivation. Irwin and Hepplestone (2012) looked into the effects of choice in timing. In that study, students could choose for themselves when they wanted to take an online assessment. Choice in timing of the assessment showed positive effects on the perceived autonomy of the students. Flexible assessment modes can be seen as a first step towards a more student-led pedagogy, while increasing student engagement in the assessment process and setting criteria (Hepplestone, 2012, p. 782).

### 8.1.5 Research tools to measure student motivation within assessments

Within motivational research it is a common practice to adjust an existing instrument to the student population to measure student motivation. The Intrinsic Motivation Inventory (IMI) of Ryan & Deci (2000) is a commonly used questionnaire to measure student motivation on an activity (e.g., Ryan, Mims & Koestner, 1983; Deci, Eghrari, Patrick, & Leone, 1994). The IMI is a questionnaire that consists of 22 statements which can be scored on a seven-point Likert-scale from 'not at all true' to 'very true'. There are four clusters within the IMI; interest/enjoyment, perceived competence, perceived choice and pressure/tension. The IMI items have often been modified to fit specific school-activities. A drawback of the IMI is that it provides insight into intrinsic motivation without examining the other motivation variants.

The overall motivation can be measured with the self-regulation questionnaire (SRQ) (Ryan and Connell, 1989; Brown, Miller, and Lawendowski, 1999). This questionnaire consists of four questions with eight statements, which can be scored on a four-point Likert-scale. The questionnaire consists of four subscales from low to high self-determining motivational styles: external Regulation, introjected Regulation, identified Regulation and intrinsic motivation. Researchers often use the two (extreme) scales, extrinsic and intrinsic, to determine whether students are more extrinsically or intrinsically motivated. The subscales can be used separately, but can also be used together as a summary score, also called the Relative Autonomy Index (RAI). The RAI indicates to what extent students are intrinsically or extrinsically motivated. This questionnaire concerns the reasons why students do their school work.

It is likely that the SRQ is the best applicable instrument to measure the perceived student motivation for development-oriented assessments, because the SRQ is able to measure extrinsic and intrinsic motivation. Because the SRQ is not specifically aimed at measuring perceived student motivation for development-oriented assessments, the questionnaire needs to be adjusted and validated. The adjustment and validation of the development-oriented assessment questionnaire will take place within study two.

In addition to the development-oriented assessments questionnaire, focus groups with students will be formed to gather information about the motivation characteristics of development-oriented assessments. Teachers will be asked to give feedback on the redesign process of the development-oriented assessment format with SDT characteristics. Besides the focus groups, qualitative data will be gathered in dialogs with the participants of the redesign within study two.

### 8.1.6 Research goals and questions

Summarized, little research has been done within secondary vocational education in the Netherlands in the field of SDT and the context of development-oriented assessments and the effect on student motivation. The main research goal is to enhance student motivation for development-oriented assessments by contributing to the autonomy of the students. Competence, relatedness and autonomy are the three basic human needs of the self-determination theory. An intervention on students' autonomy in the field of development-oriented assessments will take place in order to enhance students motivation. This intervention will focus on autonomy but may also affect the feel of competence and relatedness of the students which will be considered in the present project.

The question that will be answered in this study:

**'How can self-determination theory guide the redesign of development-orientated assessments in technical secondary vocational education aimed at enhancing student motivation?'**

The following sub-questions are composed to answer the main research question:
1. On which aspects of development-oriented assessments can choice be offered?
2. How can perceived choice within development-oriented assessments be designed?
3. What effect does increasing autonomy for a development-oriented assessment have on student motivation?

### *8.2 Design and methods*

This project uses a design-based approach to redesign a development-oriented assessment of a school period or theme to a more personalized format. Educational design research is a school of research in which the iterative development of solutions to practical and complex educational problems provides the setting for scientific inquiry (McKenney & Reeves, 2012). A design-based research is structured in steps as shown in figure 2.
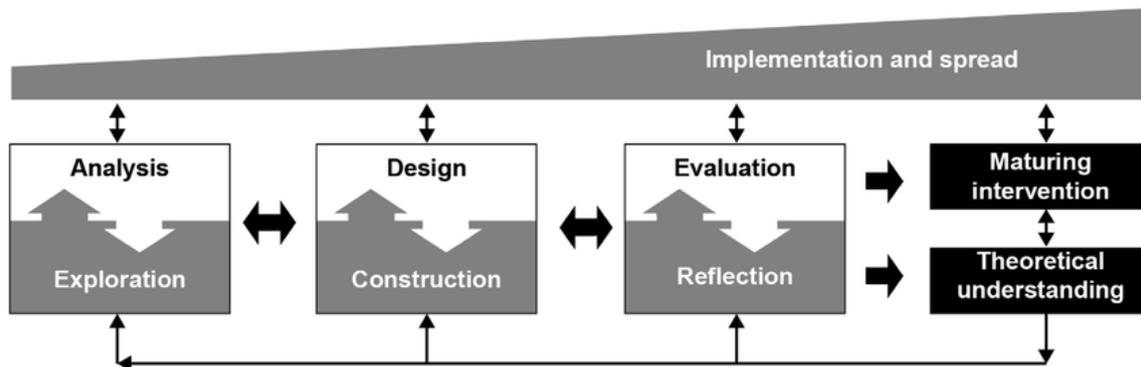


*Figure 2*. A generic model of Design Based Research (McKenney & Reeves, 2012)

This project will take place in four classes of four different technical secondary vocational education schools in the Netherlands. A class consists of, at least, 10 students in a homogeneous setting. This means that the students follow the same course, year, and type of education Beroeps Opleidende Leerweg (BOL) or Beroeps Begeleidende Leerweg (BBL) within the technical secondary vocational education in the Netherlands. There are two types of education within the Dutch secondary vocational education namely, BOL and BBL. BOL is the form in which students spend 80% of the duration of the education programme at school, students do an internship in the other 20% of the programme. BBL is the form where students work for 4 days a week as an employee at a company under supervision of an craftsman. Besides the role as employee the student is for one day a week active at school.

### **8.2.1   Study 1: Exploration**

The first study is explorative, i.e. aimed at gaining insight into the characteristics of development-oriented assessments that motivate secondary vocational students within the technical sector in the Netherlands. The first study is split in two parts:

Study 1a: A literature study will be employed to explore which choices can be offered to students to enhance perceived autonomy within development-oriented assessments.

Study 1b: Three focus groups will be formed in the three different technical secondary vocational schools. The focus groups will consist of each six to eight students in year one. Three or four focus group meetings will be held, depending on when data saturation occurs. Data from the focus groups will be coded to be able to distil characteristics within development-oriented assessments that are motivating for the students.

### **8.2.3   Study 2: Redesign, implementation and analyses**

Study 2 is the redesign of the development-oriented assessments, implementation, and analysis of the redesign process.

This redesign phase will involve three cycli within three different schools, parallel to each other to enable interim adjustments to the design process. Each of the participating assessment constructors will be asked to choose one development-oriented assessment for redesign, in consultation with the researcher. The intention is to design a more personalized format of development-oriented assessment in order to enhance student motivation. The learning goals of the development-oriented assessment are determined before the start of the school period or theme. Each phase within the redesign process is guided by the researcher and entails three training sessions of two hours at the school of the assessment constructors.

The aim of the first session is to clarify the SDT and elaborate upon the findings of study 1 and depict characteristics for the redesign phase. The goal of the second session is to develop a blueprint for the redesign of the development-oriented assessment, in which the students experience more autonomy than within the conventional assessment. The aim of the final session is making a plan on how the

development-oriented assessments will be implemented in the theme or period. Then, after the redesign phase, the newly designed development-oriented assessments will be implemented in class. Informal conversations with teachers and students will be used to evaluate the redesign process. An development-oriented assessment motivation questionnaire, adapted from the SRQ, will be used for the same purpose. Data in order to validate the development-oriented assessment motivation questionnaire will be gathered during study 1 and 2.

### 8.2.4   Study 3: Evaluation study

Study 3 is an evaluation study that consists of the evaluation of a most optimal redesign. The final redesign will incorporate the lessons learned in the previous studies, and will be implemented in the curriculum of a fourth school.

The fourth school will be chosen based on the following selection criteria: The school is not yet involved in this research, the participating school has at least two classes within the same cohort within the same course. Each class consists of at least 15 students. An independent school is important in order to collect reliable data, and the size of the group is important to gain valid data. Two classes in the same cohort is important for the use of a control group. One class will fill in the assessment questionnaire just before they take the conventional assessments. The assessment of the same subject will be redesigned to an development-oriented assessment format with SDT characteristics, within the other class. The final redesign will be implemented in the curriculum. Students will fill in the development-oriented assessment motivation questionnaire before they take the development-oriented assessment but after they have chosen what kind of development-oriented assessment format they want to take. The data from the development-oriented assessment motivation questionnaire will be analysed to determine in which way SDT-characteristics in the development-oriented assessment format contribute to the student motivation for development-oriented assessments. The data will be compared with the class which took the conventional assessment format. Relevant assessment results of the past years will be compared with the current results, in order to indicate the differences in groups and other influencing factors (e.g. teacher and format). Besides the quantitative data, a more qualitative form of data will be gathered during (in)formal conversations with the students and teachers involved in this study.

### 8.3 Scientific importance and added value

The search for increasing student motivation is an issue that concerns many (Deci & Ryan, 2000; Kamstra, 2015; Ros, Lieskamp, & Heldens, 2017; Martens, Gulikers, & Bastiaens, 2004; Meusen - Beekman, Joosten - ten Brinke, & Boshuizen, 2016; Steen, 2015). A lot of research has been done in the field of personalized learning and assessments. However, it seems that there hasn't been done any research into the field of student motivation for assessments in secondary vocational education. Moreover, the results of this research provide more insight into the SDT projected on development-oriented assessments. This input can lead to more student motivation for development-oriented assessments and is therefore added value for science.

### 8.4 Originality

There are few secondary vocational schools which have personalized their development-oriented assessment format. When students experience freedom of choice within development-oriented assessments, they might be more motivated to take the development-oriented assessment. Because this is a relatively new approach of assessments no research has been done on the effect on student motivation.

### *8.5 Expected scientific output*

| | Type of output: | Title: |
|---|---|---|
| **2021** | Article 1 | Motivation-enhancing characteristics within development-oriented assessments |
| | Article 2 | Redesign process of development-oriented assessment format based on the SDT |
| **2022** | Validated assessment motivation questionnaire | Development-oriented assessment motivation questionnaire based on SRQ |
| **2023** | Article 3 | Validation of the development-oriented assessment motivation questionnaire |
| | Article 4 | Effect on student motivation for an development-oriented assessments based on the SDT |
| **2024** | Dissertation | Student motivation for development-oriented assessment |

### *8.6 International orientation (optional)*

The research will take place in the Netherlands and might be transferable to other countries with similar vocational education like Germany for example. The results of the research can be compared with similar international researches to generalize conclusions. This will be an item in the discussion chapter of the dissertation. This study will be presented during international congresses e.g. The European Association for Practitioner Research on Improving Learning (EAPRIL) and Onderwijs Research Dagen (ORD) and results will be published in international journal e.g. The International Journal of Assessment and Evaluation.

### *8.7 Practical significance*

Three school teams will experiment with a more personalized format of development-oriented assessments with the aim to contribute to student motivation. These three cases will serve as an example to make the shift to a more personalized development-oriented assessment format. The most successful design will be rolled out at a fourth school team. Hopefully this project will inspire other teams to learn from it and to adopt the fundamental idea of personalized development-oriented assessments. Within Summa College I will get the opportunity to support, together with teachers who participate in a master study, other school teams (other than technical teams) with the transition to a more personalized development-oriented assessments format.

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