Radboud University

Master thesis Organizational Design and Development

Ideal structure design for primary school SamSam

Problems within the Primary School System of the Netherlands: structure related?

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Abstract

. The range of tasks of primary school teachers is increasing and the expectations of the children's parents are increasing. Teachers experience a lot of work-related stress and do not feel sufficiently supported by the government. Unfortunately, this is not a new problem.

Teachers experience little autonomy in their work and feel more concerned with administrative work than with teaching. This is unfortunate because many have become teachers for the sake of teaching and not for administrative work, in this way the passion for the subject disappears.

These circumstances make it interesting to take a different perspective on this problem: a structural perspective. A large part of work-related stress can be caused by how the organization is structured. This research took a structural perspective on the basis of De Sitter's theory as described by Achterbergh & Vriens and Kuipers, Amelsvoort & Kramer. On the basis of the works of these authors, I carried out a diagnosis at three different schools to find out how their structure works and what consequences this has for the work of the teachers. These diagnoses showed that a difference in structure can have an effect on the perceived autonomy and work related stress of teachers. Therefore, these diagnoses laid the foundation for the final new design for primary school SamSam

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1. Introduction

The complexity within the educational sector increases, they have to deal with changes in the environment and with an increase in demands. Because professional practice is changing at an ever-increasing rate, factual knowledge is becoming less important because it is becoming outdated. Competences to cope with rapidly changing circumstances are becoming increasingly important. Educational institutions are expected to respond flexibly with a new approach to training and learning. A school must have the capacity to adapt curricula and forms of education more quickly than before (Kommers, 2009, p.2).

Besides the need for more flexibility there is an increase in complexity due to changes in the needs and characteristics of the children. Expectations that education matches individual needs and opportunities have increased significantly. Working with individual learning pathways and portfolios in which children together with teachers shape their individual learning process, being able to put together their own weekly timetables adapted to the pupil's activities outside school. These are just a few examples of forms in which pupil needs are addressed much more (Kommers, 2009, p.3; Kommers & Dresen, 2010, p.16). The law of 'passend onderwijs' also contributes to the expectations to tailor education to the individual needs of the children, and thus adds to the complexity. The aim of the law is for all children to have a place in a school that matches their qualities and abilities. Even if they need extra support ("Wet passend onderwijs - Onderwijs-zorgarrangementen | NJi", z.d.).

This individualistic approach has given the teacher a lot more work. And despite an increasement of 5% in FTE within the primary education, there is still a prevailing shortage of FTEs (Ministerie van Onderwijs, Cultuur en Wetenschap, 2020). Teachers are protesting because if insufficient action is taken it is expected that the shortage will increase to a shortage of 4800 FTEs in 2024. The deficit is now 1700 FTEs (Khaddari, 2020).

1.1 Research context

Within this thesis I will focus on primary education. Within a primary school the 'product' pupil flows through the process, going from one teacher to another teacher. The teachers are links within the chain of the development of the children (Kommers, 2009, p.4).

The new demands placed on education increase the need for coordination; not only professional knowledge is important but also cross-curricular cooperation. In addition, there is the increase in the variety of pupil flows, as a result of which the total amount of coordination required between the teachers increases exponentially (Kommers, 2009, p.4; Kommers & Dresen, 2010, p.16).

In a situation where so much coordination is needed there is always a lack of communication. The complaint that arises is that bad communication is taking place where you can argue that the problem

is rather that there is simply too much communication due to the arisen complexity. This makes it unclear who exactly is responsible for the final result. It is difficult to keep an overview and teachers have the feeling that they are just a small cog in the whole which leads to feeling powerless and this can lead to feeling of stress (Kommers, 2009, p.4; RTL Nieuws, 2020).

In daily practice teachers often miss having a say (Zwik, 2016). Two examples where autonomy has been kept from teachers:

1) Mandatory attendance. Often the school determines what times the teachers have to be present. This applies in situations where they have to teach but also on days when they are not teaching. This results in situations where spend class-free days at school to work on their 'non-time and place bounded' school tasks (Zwik, 2016).

2) 'Normjaartaak' this describes the annual task of a teacher. 'Normjaartaak' consists of: teaching tasks, lesson-related tasks, individual professionalization, sustainable employability and other tasks ("Normjaartaak - uitleg begrippen onderwijs", 2020). Despite the fact that the 'normjaartaak' has a specific division in hours, it is not often divided that way. The school management often unilaterally chooses the activities and then plans these hours as individual professionalization rather than as a school task. There will then be few to no hours left for your own professionalization wishes (Zwik, 2016).

The experience of having little autonomy in combination with the feeling of stress can lead to burnout complaints. The burnout complaints result in a high absenteeism in primary education. In 2017, teachers in primary education missed out on around 6 percent of the working days, while this was on average 4 percent for all industries (Traag, 2018).

Teachers think it is important to have a good quality of work, they want meaningful work and don't want to feel that their attention has to wander off to all kinds of things that don't really matter, and don't want to be disturbed constantly (Kommers & Dresen, 2010, p.13).

1.2 Connecting the research context with the 'Moderne Sociotechniek'

The problems described above can be linked with the concepts of quality of work and quality of organization (Achterbergh & Vriens, 2010, p.241). Quality of work is about '*the meaningfulness of jobs and (the possibility to deal with) work related stress'* (Achterbergh & Vriens, 2010, p.241). The quality of organization is '*the organization's potential to effectively and efficiently realize and adapt its goals'* (Achterbergh & Vriens, 2010, p. 241).

The feeling of stress and the experience of having low autonomy in the jobs of the teachers possibly stems from them not being able to properly deal with disturbances that occur in their day-to-day work and cause work related stress.

The quality of organization can be linked to the problem of the existing differences in needs of each individual child. The differences in need asks for flexibility of the teacher and can also lead to more work. The differences in needs of the children requires a varied set of approaches which are coupled to an increasing amount of documentation and communication. The quality of work and organization thus have an influence on sick leave, but also on the required FTEs. Together this has an influence on the threatening shortage. Quality of work and organization are seen as an organization's societal contribution (Achterbergh & Vriens, 2019, p.47). The way an organization can secure their societal contribution is to have a structure that supports the activities needed for the societal contribution. Therefore, within this thesis I will look at the structure of the organization.

The problems within the educational sector and in specific within the primary schools in the Netherlands have been going on for many years. Therefore much is already known about the situation and I will not have the illusion that a partial fix will solve the problem. An integrated approach to come up with a solution will be necessary. The essence of an integrated approach is that the starting point of any innovation process is the strategic positioning of the organization in its environment and not an ideologically inspired movement (Kuipers et al., 2012, p.34). An organization must be understood against the background of the environment in which it operates (Kuipers et al., 2012, p.35). By the growing complexity brought about by the changing environment, it is logical to understand a primary school against the background of the environment in which it operates. Also according to the integrated design approach the optimization of the quality of work and organization can go hand in hand. Both those qualities are important for the problems at hand, this is because quality of the organization can improve the flexibility and the quality of work can for example cause more involvement in the entire work process (Kuipers et al., 2012, p.39). This is important for the increasing complexity caused by the changing environment the schools have to operate in and the experienced low autonomy and little overview of the whole process.

To make an integrated design means that when looking for a new structure, the designer has to detach herself from the existing structure and that, moreover, the designer does not have to incorporate all kinds of restrictions in the design on the basis of assumed feasibility. Once the designer has consistently thought through what the design should ideally look like, she can translate the constraints and conditions she is bound by, in the short and long term, into a realistic plan (Kuipers et al., 2012, p.42). I will motivate this choice further in the following chapter.

1.2.1 Earlier research on the topic

Kommers and Dresen (2010) have already used an integrated design approach for the educational sector. However their focus was on secondary- and higher education, where this research will focus on primary education. There is a significant difference between primary education and higher education. The difference lies mainly in the size of the school and the different levels of intelligence of children

who are in a class together. In primary school, children with all different levels, classified by level of intelligence (vmbo, havo and vwo), are together in one class. It is only after the primary school that a division of those three levels takes place. At secondary school, children are divided into classes according to these three levels of intelligence. Of course, there is also a difference between these children and their intelligence, but the differences are less pronounced than in a class at the primary school.

Another point where primary education differs from secondary education is that in secondary education there is one teacher per subject. In primary education, the majority is taught by a teacher, with the possible exception of the subjects of music and gymnastics. Due to this division of subjects and teachers in secondary education, the children also move from classroom to classroom where, in primary school, the children have a permanent classroom.

1.3 Research question and research framework

Because my research has limits, considering time, it would not be possible to actually implement a new structure. Therefore I need a primary school that is willing to cooperate with me, on an integral way, to come up with such a long-term plan. The primary school that was willing to cooperate was also directly a really suitable candidate because two years from now they have to leave their current building for a new building, that will be built for them according to the program of requirements that the school will hand in. So a long-term plan can in this case contribute to a matching new school building. The research will take place at SamSam Oosterhout. SamSam exist out of 28 employees and 321 pupils divided over 15 classes.

As mentioned earlier this research will look at the structure of the school. But what is a structure? And moreover, what is an ideal structure? A structure is more than a hierarchy of functions within an organization. An organizational structure is defined as a network of related tasks, where a task is defined as performing a particular (transformation) process to realize the end state (Achterbergh & Vriens, 2010, p.231). An ideal structure is designed in a way that they are not a source of disturbances itself and that it comprises the means to deal with disturbances (Achterbergh & Vriens, 2019, p.65). Also, as mentioned earlier a well-designed structure supports the activities needed for the societal contribution of an organization, which were the quality of work and organization.

The research question of this thesis will be as followed:

How can the structure of a primary school like SamSam be redesigned in such a way that quality of work and organization will improve and reduce the current high work-related stress?

To answer this question an analysis of the current structure of SamSam will be done and later compared to the structure of alternatively structured primary schools. Comparing schools that

experimented with their structure with the structure of SamSam will lead to inspiration for the new structure design for SamSam and will be followed by an expert greenfield design approach.

Structure design can be executed in multiple ways, it mostly depends on the type of work, primary process and/or the context of the organization which method will be most suitable for the situation. Within chapter 2 I will elaborate on a couple of those design theories and will substantiate why I chose the integrated redesign chain for this research.

1.4 Research goal and relevance

The main goal of this research is to gain insight in the problems that occur in the primary schools of the Netherlands from a perspective that has hardly ever been taken yet; a structure perspective. Taking this perspective will help establish whether a change in structure could help with the solution of the problem. This is also the practical relevance of this study. At the end of the thesis I hope to give a new design for an ideal structure for SamSam. The academic relevance lies in the practical nature of my research. By applying the theory to this case, it can lead to results that can be of added value to the already existing theory.

1.5 Outline of thesis

In the coming chapter there will be an explanation of the integrated redesign chain and elaboration on why this best fits my research. I will give definitions of the most important terms that I will use during this research. This is followed by an explanation of the method I will use. This chapter is followed by the results, the conclusion of the study and finally a reflection on the findings and their meaning.

2. Theoretical Framework

In this chapter I will reflect on different design theories and provide an outline of the concept of structure which is the most relevant theoretical concept within this research. At the end of the chapter I will elaborate on the chosen design theory and its steps.

2.1 Structure design theories

There are multiple ways to design and redesign a structure. For my thesis I will use the integrated redesign chain from Kuipers, Amelsvoort & Kramer (2012). To motivate this choice, I will give a short characterization of different organizational design theories. I briefly will discuss the theory of Lean, Thompson and the integrated redesign chain which is cybernetically substantiated by de Sitter. In order to make a considered choice of which theory best suits my research question I will look at the pragmatic validity of the theories and the attention that they have for the quality of work and quality of organization.

Scientific validity does not by definition guarantee usefulness to practitioners (Worren, Moore & Elliott, 2002, p.1228). The pragmatic validity of knowledge can be judged by the extent to which goals or intended consequences can be achieved by producing certain actions or using particular instruments (Worren et al., 2002, p.1228)

A high pragmatic validity is important because I want to put the theory in practice to make a new design for the organizational structure of SamSam. The quality of work and organization are important because of the problems of work-related stress, having the experience of little autonomy in the job and the increasing difference in the needs of children which demands flexibility and innovation.

2.1.1 Review of design theory of Lean

The goal of Lean is to maximize customer value and reducing waste (Smits, 2019). Lean provides five clear steps (1) define customer value, (2) identify value stream, (3) make value creating steps flow, (4) design and provide what the customer wants only when the customer wants it (pull) and (5) pursue perfection (Smits, 2019). Therefore, the theory of Lean has pragmatic validity as it gives clear guidelines on how to limit waste within the organization, and at the same time have maximum customer value.

However, the theory of Lean has its roots in mass production and is predominantly focused on manufacturing companies. The theory does not explicitly pay attention to work related stress that employees might experience, and thus not that specific to the quality of work. The focus on reduction of waste offers little room for flexibility which is related to one of the evaluation criteria, the quality of organization. Because a primary school is not that similar to a manufacturing company and the case is about work-related stress that the employees experience I have chosen not to use Lean as main theory.

2.1.2 Review of design theory of Thompson

Besides Lean, there is also the theory of Thompson, Scott & Zald (2003). The goal of Thompson is to understand and model organizational action. He tries to understand and model organizational action on the system level of the organization, therefore he is not interested in managers or individuals (Moorkamp, 2019). Thompson looks at organizations from different angles. In the goal of understanding organizational action he does not consider one way as the truth, but considers different approaches (Moorkamp, 2019). So, one approach would be to look at organizations as closed systems, they are predictable. Another approach would be to look at organizations as open systems, they are more adaptable. Both perspectives have added value but seem (or are) contradictory, Thompson considers them both as being possibly true (Moorkamp, 2019). This also brings the downside of the theory of Thompson; it is not easily applicable as for example the five steps of Lean, therefore this theory does not have a high pragmatic validity. Also because of the focus on the organizational level and not on the individual level Thompson does not explicitly pays attention to the work-related stress and the quality of work that employees experience. Therefore, I haven't chosen to use Thompson as main theory for this research.

2.1.3 Review of the Integrated redesign chain

The integrated redesign chain gives, just like Lean, clearly defined steps. It is a socio-technical theory, cybernetically profound. In this theory the structure of an organization should facilitate self-regulation and designing a viable distribution of work is therefore important (Smits, 2019a). This theory is based on the theory of de Sitter whose essential variables are quality of organization, quality of working relations and quality of work (Achterbergh & Vriens, 2010). Because of the emphasis on the quality of work and organization within this design theory, together with the pragmatic validity because of the six defined steps, make this the most suitable theory to use in order to give an answer to my research question. I chose to mainly base the definitions within this thesis on the authors Achterbergh & Vriens and Kuipers, Amelsvoort & Kramer. The integrated redesign chain is mainly built on the principles of de Sitter. Achterbergh & Vriens give a good reflection of de Sitter's work, and expressed the work in a clear way. By using the definitions of Achterbergh & Vriens for the different important concepts the definitions will be well aligned. Kuipers, Amelsvoort & Kuipers (2012) have worked out the different steps of the integrated redesign chain and therefore contributed to the pragmatic validity of this design theory. For that reason, I will mainly base myself on them in the elaboration of the design theory.

2.2 Concept of structure

In order to give an answer to my research question how structure redesign can reduce work related stress in primary schools, it is important to have a clear definition of what is meant by structure within this thesis.

"Structure is the way tasks are defined and related into a network of tasks" (Achterbergh & Vriens, 2019, p.46). This means that structure is "a configuration of tasks, or the grouping of sub-transformations into tasks and the coupling of tasks resulting from this grouping" (Achterbergh & Vriens, 2019, p. 240). Or differently framed "an organizational structure can be defined as the grouping and coupling of transformations into tasks and the resulting relations between these tasks relative to orders" (Achterbergh & Vriens, 2010, p.240).

To better understand the concept of structure I will elaborate on the concepts of tasks, orders and activities below.

2.2.1 Tasks, orders and activities

In order to build further on the understanding of these definitions, the definition of tasks and orders have to be established. The definition as formed of a task by Achterbergh & Vriens (2019) is: "A task is a set of sub-activities which comes into existence by decomposing the main organizational activity" (Achterbergh & Vriens, 2019, p.48). An order is defined as: "a request for the realization of some specific desired effect (e.g. a product or service)" (Achterbergh & Vriens, 2010, p.240).

Given the multiple definitions I will use a combination of them to come with an overall definition of structure that will be used as followed in this thesis;

A structure is twofold and consists of a production structure and a control structure. The way the organizational primary process is divided into operational tasks refers to the production structure. Those tasks are defined and related into a network of tasks. A task is an activity or a set of sub-activities that is assigned to a capacity. The control structure relates to the regulation of the primary process and is about grouping and coupling of regulatory tasks (Achterbergh & Vriens, 2019, p.51-52).

Every activity contains (1) a begin state, (2) a process and (3) an end state. Subsequent all activities can be decomposed into sub-activities in two ways: in parts and in aspects (Achterbergh & Vriens, 2019, p.48).

2.2.1.1 Activities subdivided by parts

Parts splits up the organizational process in several steps, which means you insert desired end states between original begin- and end state (Achterbergh & Vriens, 2019, p.50).

2.2.1.2 Activities subdivided by aspects

Aspects cover the whole organizational process, so no new desired end states are inserted. Rather, they still cover the complete original activity, but only with respect to the selected characteristic.
Special attention of subdivision of activities into aspects is for the aspects 'operational' and 'regulatory'. The operational aspect of an activity refers to the activities realizing the end state. The

regulatory aspect refers to all activities enabling the smooth performance of these operational activities (Achterbergh & Vriens, 2019, p.51).

When decomposing the main organizational activity, you automatically create dependency relations. This means that by defining tasks, their position in a network of tasks becomes apparent (Achterbergh & Vriens, 2019, p.51).

> "Given a set of operational and regulatory sub-transformations a designer should compose tasks and relate them in such a way that an "adequate configuration of tasks" emerges by means of which the organization's "primary transformation" can be realized. This configuration should be designed I such a way that it attenuates disturbances as much as possible, and, at the same time, amplifies the regulatory potential to deal with the remaining disturbances. In other words, a designer should design "cybernetically sound organization structure"." (Achterbergh & Vriens, 2010, p.240).

Organizational structure can be distinguished into two sub-structures: a production structure and a control structure. The production structure refers to operational transformations and grouping them into tasks whereas the control structure refers to regulatory transformations and coupling them into tasks (Achterbergh & Vriens, 2010, p.240-241).

To better understand why a distinction is made between these substructures, I will further elaborate on these two structures in the next section and relate them to the organizational criteria: quality of work and quality of organization.

2.2.2 Production structure and control structure

Given a set of operational and regulatory sub-activities a designer should compose tasks and relate them in such a way that an adequate configuration of tasks emerges by means of which the organization's primary activity can be realized (Achterbergh & Vriens, 2010, p.240).

> "The resulting network of tasks can be said to cover the operational aspect of the whole organizational transformation: the production structure. The tasks in this production structure, as well as groups of tasks have to be regulated. This means that, relative to the network of operational tasks (realizing the primary organizational process), a network of tasks dedicated to dealing with the disturbances in the production structure should be identified. De sitter calls this network of regulatory tasks the control structure" (Achterbergh & Vriens, 2010, p.236).

So, the production structure has to do with realizing the primary process and is about the grouping and coupling of operational tasks. The control structure relates to the regulation of the primary process and is about grouping and coupling of regulatory tasks (Achterbergh & Vriens, 2019, p.51-52).

> "The organizational structure is the combination of the production and the control structure. Given these two-substructures, designing an adequate organizational structure now means designing an adequate (1) production structure relative to orders and (2) control structure relative to the production structure." (Achterbergh & Vriens, 2010, p.241).

When relating tasks to organizational structures there is a minimum of two organizational variables that should be taken into account: quality of work and quality of organization. These variables have been discussed before, but in the next subsection I will go into more detail about what these variables entail.

2.2.3 Organizational criteria: quality of work and quality of organization

The quality of work is about the meaningfulness of jobs and the possibility to deal with work related stress. Quality of organization refers to an organization's potential to effectively realize and adapt its goals (Achterbergh & Vriens, 2019, p.63).

Related to those relevant organization variables are external functional requirements. This are requirements set by modern (business) environments that should be met, in order to secure the organization's viability (Achterbergh & Vriens, 2010, p. 241). Similarly, there are two external functional requirements in the category of quality of work: a low level of absenteeism and a low level of personnel turnover (Achterbergh & Vriens, 2010, p.241). The category of quality of organization consists out of three external functional requirements: order flexibility, control over order realization, and potential for innovation (Achterbergh & Vriens, 2010, p. 241).

The establishment of the production structure and the control structure can be an important contribution to the quality of work and organization. Besides the external functional requirements there are also internal functional requirements, this are requirements that an organization must meet in order to establish the external functional requirements (Achterbergh & Vriens, 2010, p.242). These requirements are a generic set that needs to be translated to the specific redesign case at hand, this will follow later on in the thesis.

Table 1 - Overview of the internal and external functional requirements of the organizational variables

	External functional requirements	**Internal functional requirements**
Quality of work	Low level of absenteeism	Controllable stress conditions
	Low level of personnel turnover	Opportunities to (1) be involved, (2) learn, and (3) develop
Quality of organization	Order flexibility	Short production-cycle time Sufficient product variations Variable mix of products
	Control over order realization	Reliable production and production time Effective control of quality
	Potential for innovation	Short innovation time Strategic product development

(Achterbergh & Vriens, 2010, p.242).

2.3 Structural design parameters which cover the production and control structure

A more detailed way to describe structures can be done by using so-called 'design parameters'. Design parameters are "specific instantiations of decomposition in parts and aspects" (Achterbergh & Vriens, 2019, p.54). Within organization theory there are several descriptions of design parameters, but in my thesis I will use the seven design parameters by de Sitter as described by Achterbergh & Vriens (2019). Organizational structures can be described on the basis of these parameters.

"That is, each of these parameters can have different 'values', and, dependent on these values, the organization's structural layout has particular characteristics, enabling or disabling organization members to act in particular ways." (Achterbergh & Vriens, 2019, p.54).

Design parameters can not only be used in a descriptive manner but also in a normative manner. Given desired values of the design parameters someone can make a design or redesign of the structure in a way to make sure that those desired values of the parameters are met (Achterbergh & Vriens, 2019, p.54). After given the description of the seven parameters I will briefly pay attention to what low or high values on parameters mean for the adequacy of the structure. The design parameters can be divided into three categories: (1) those related to the production structure, (2) those related to the control structure and (3) one related to both structures.

2.3.1 Design parameters related to the production structure

1. The degree of functional concentration
   "the degree of functional concentration depends on the degree to which operational tasks are (potentially) related to all order types" (Achterbergh & Vriens, 2019, p.55). An order is in this case an individual demand for a product or service, which makes an order type a particular sub-set of all orders (Achterbergh & Vriens, 2019, p.55).

   Organizations with a high value on this parameter typically have operational units in which tasks are clustered based on the similarity of activities, or knowledge and skill (Achterbergh & Vriens, 2019, p.55).
   Organizations with a low value on this parameter will not have operational tasks that are coupled to all order types, but only to one or a few of them.

   > "Given several order types, one way to decrease functional concentration is to make sure that each of the defined order types has its own dedicated set of operational activities. In this case, organizational units are formed which have their own personnel and equipment dedicated to their 'own' order type" (Achterbergh & Vriens, 2019, p.55).

- place – referring to where a segment of the market demanding orders resides, resulting in geographical order-categories, such as orders for region north, orders for region south;
- client – classifying orders in terms of the types of clients demanding them, such as large industrial clients or small business clients, public or private clients;
- output – classifying orders based on the products or services provided, such as types of furniture, types of healthcare
  (Achterbergh & Vriens, 2019, p.55)

2. The degree of differentiation of operational tasks
   The differentiation of operational activities happens in three levels: production, preparation and support activities. Production and preparation activities are directly order-related. The third set of operational activities are not directly tied to orders. Support activities help to realize and connect the two other operational activities, it includes for instance maintenance, technical services or internal logistics (Achterbergh & Vriens, 2019, p.58).

   Organizations with a high value on this parameter will have the activities grouped into separate production, preparation and support tasks.
   Organizations with a low value on this parameter will have operational tasks that include production, preparation and support activities (Achterbergh & Vriens, 2019, p.58).

3. The degree of specialization of operational tasks
   "The degree to which operational tasks contain only a small part of the complete operational process" (Achterbergh & Vriens, 2019, p.59).

   Organizations with a high value on this parameter have their operational process split up into sub-activities and have them allocated to separate tasks.
   Organizations with a low level on this parameter have their operational tasks cover the complete operational process (Achterbergh & Vriens, 2019, p.59).

2.3.2 Design parameter related to both the production- and the control structure

4. The degree of separation
   "This design parameter refers to the degree to which regulatory and operational activities are assigned to different tasks" (Achterbergh & Vriens, 2019, p.60).

   Every activity has a regulatory and an operational aspect. Organizations with a high value on this parameter have a structure which has operational tasks that contain as few regulatory activities as possible. Those organizations have one set of tasks dedicated to the production structure and a separate set of tasks dedicated to the control structure (Achterbergh & Vriens, 2019, p.61).

Organizations with a low value on this parameter have tasks whereby operational and regulatory activities are integrated as much as possible. Tasks contain activities relating to both structures (Achterbergh & Vriens, 2019, p.61).

2.3.3 Design parameters related to the control structure

5. The degree of differentiation of regulatory activities into 'parts'
   Regulatory activities include three sub-activities (parts): monitoring, assessing and acting (Achterbergh & Vriens, 2019, p.59). Monitoring refers to gathering information with respect to indicators which define what should be monitored, such as quality indicators or quantity indicators (Achterbergh & Vriens, 2019, p.59). Assessing includes a comparison of the indicator values with norm values and a judgement with respect to their difference (Achterbergh & Vriens, 2019, p.59). Acting is about taking measures to make sure that problematic differences between actual and desired/norm values on the indicators are dealt with.

   Organizations with a high value on this parameter have the sub-activities mentioned assigned to different tasks.
   Organizations with a low value on this parameter have the sub-activities integrated into one task (Achterbergh & Vriens, 2019, p.60).

6. The degree of differentiation of regulatory activities into 'aspects'
   "Within organizations there are three forms of regulation: strategic regulation (setting and resetting goals), regulation by design (designing and redesigning the infrastructure), and operational regulation (dealing with day-to-day disturbances in operational processes given the existing goals and infrastructure" (Achterbergh & Vriens, 2019, p.60).

   The degree of differentiation of regulatory activities into aspects depends on whether these three forms of regulation (aspects) are assigned to separate tasks or whether tasks contains all three forms (Achterbergh & Vriens, 2019, p.60).

   Organizations with a high value on this parameter have the different forms of regulation assigned to different tasks.
   Organizations with a low value on this parameter have tasks containing all three forms of regulation (Achterbergh & Vriens, 2019, p.60).

7. The degree of specialization of regulatory activities
   As well as the operational activities, regulatory activities can also be broken down into sub-activities, irrespective of parts and aspects. The degree of specialization has to do with the regulatory scope (Achterbergh & Vriens, 2019, p.60). The value of this parameter increases as the decomposition of a particular regulatory transformation increases, and as these regulatory

sub-transformations become separate tasks (Achterbergh & Vriens, 2010, p.251). The specialization of regulatory activities decreases as sub-transformation of a regulatory transformation are integrated into one task. (Achterbergh & Vriens, 2010, p.252).

Organizations with a high value on this parameter will have a smaller regulatory scope than organizations with a low value on this parameter.
Organizations with a low value on this parameter will have a broader scope in terms of a larger part of the operational process or a larger number of regulators under supervision (Achterbergh & Vriens, 2019, p.60).

2.4 What influence does the value of the parameters have on the adequacy of the structure?

There are two criteria for a structure that an organizational structure should meet in order to be adequate (1) a structure itself should not be a source of disturbances and (2) a structure comprises the means to deal with disturbances. When structures are adequate they support four basic activities of an organization which in turn will realize the organizational criteria for quality of work and organization. I will elaborate further on the criteria for an adequate structure and their effect on the organizational criteria in the next subsection.

2.4.1 Criteria for adequate structure

Below I will elaborate on the two criteria that are set for adequate structures.

1. A structure itself is not a source of disturbances
   A disturbance is some event or state of the world that has the potential to negatively influence the relevant organizational criteria. Structures can be a source of disturbances themselves by the number of relations in the network and the variability of these relations. The higher the number of relations in the network of relations, the higher the probability of disturbances, as every relation introduces possible sources of disturbances (Achterbergh & Vriens, 2019, p.65). The propagation of disturbances through the network of relations can produce change in the total state and dynamics of the organization. The disturbances can spread via "unexpected pathways and with unanticipated amplification" to completely reorganize structure (McNaughton, 1992, p.310). The variability of the relations within the network refers to the variety of content of these relations. This content may be either physical or other information, the more varied this content, the higher the probability of disturbances (Achterbergh & Vriens, 2019, p.65).

2. A structure comprises the means to deal with disturbances
   Just because a structure can be designed in such a way that itself is not a source of disturbances does not mean that all disturbances affecting the organization can be

> designed away. Many disturbances do not originate from the organizational structure but still need to be dealt with. Organizations should therefore have the regulatory potential to deal with disturbances *(*Achterbergh & Vriens, 2019, p.65).

"For structures, this means that tasks should be designed in such a way that they comprise enough regulatory potential. That is, in structures, operational regulation, regulation by design, and strategic regulation should be built into tasks" (Achterbergh & Vriens, 2019, p.66).

2.4.2 Four basic activities for every organization

As partly mentioned there are four basic activities that every organization needs to perform. When performed right these activities can realize the organizational criteria for quality of work and organization, provided they are supported by an adequate structure. The four basic activities contain the following:

1. Performing primary process – realize transformation process leading up to organization's products and services
2. Operational regulation – dealing with disturbances in the transformation processes
3. Strategic regulation – set goals related to the primary process
4. Regulation by design – providing an installation of organizational conditions so that all activities can be performed
   (Achterbergh & Vriens, 2019, p.25).

Adequate structures support the four basic activities if they have a low probability of disturbances and enough regulatory potential (Achterbergh & Vriens, 2019, p.68). If the organizational structure enables the organization to perform the four basic activities, the four basic activities will realize the organizational criteria of quality of work and organization.

Relating this all back to the seven design parameters: high parameter values are not likely to meet the criteria for structural adequacy.

> "The main idea is that high parameter value structures have a high probability of disturbances, and lack the required potential to deal with disturbances, and lack the required regulatory potential to deal with disturbances. Because of that, they have problems realizing the four basic activities, and hence fail to meet the two main criteria for structural adequacy."
> (Achterbergh & Vriens, 2019, p.69).

Low parameter values stand a better chance of meeting these criteria (Achterbergh & Vriens, 2019, p.84).

2.5 How can the design of the production and control structure contribute to the quality of work and organization?

The design of the production and control structure is about the way the design parameters are designed. Contribution of the design of the production and control structure to the quality of work and organization has to do with the values of the parameters. Above I already mentioned that low parameter values are more desired, and are more likely to meet the organizational criteria of quality of work and organization. In order to emphasize this statement, I will elaborate on what high values on design parameters mean for the two organizational criteria.

2.5.1 Characterization of a high parameter value structure

> "A high level of differentiation of operational tasks entails that preparation, production, and support activities are assigned to different tasks. Moreover, specialization of operational activities leads to a large number of small jobs with a short cycle time. In a high value parameter structure the operational activities are separated from a hierarchy of regulators (parameter: separation). These regulatory jobs have been differentiated into jobs dedicated to strategic regulation, regulation by design, and operational regulation; and into jobs tied to monitoring, assessment, and adjustment activities. There is a specialization of regulatory tasks into small tasks with only a limited regulatory range.
>
> > What emerges is what de Sitter calls a complex network of simple jobs. Jobs are simple as most of them have a small scope – i.e. operational tasks with a short cycle time, covering only a small part of the total production process, or regulatory tasks with only a small regulatory coverage. These jobs also have little regulatory potential to deal with their 'own' disturbances, as this potential has been separated and differentiated away to other jobs. The structure is complex because it contains a large number of interfaces relating a large number of simple jobs." (Achterbergh & Vriens, 2019, p.69).

2.5.2 Effect of high parameter value structure on quality of organization

To show the effect of a high parameter value structure on the quality of organization I will describe the effect on every external functional requirement of this organizational criteria.

Order flexibility – high values on the design parameters lead to long waiting times because of the many disturbances that can occur and the lack of ability to deal with them in a punctual and adequate manner. In functionally concentrated structures there is an inevitable batch-and que production which also contributes to the long waiting times. Long waiting times make it difficult to realize a short 'production cycle times'. If short production cycle times can't be managed the organization will most

likely not be able to react swiftly to changes in demand, which covers order flexibility (Achterbergh & Vriens, 2019, p.77).

Control over order realization – the detachment of regulatory activities from operational activities makes a fast and relevant reaction to disturbances problematic. "And not being able to deal with disturbances in one part of the process causes delays and hence affects other parts of process." (Achterbergh & Vriens, 2019, p.77). Being able to manage reliable production time becomes difficult in such a situation. Similarly, it is difficult to control the quality of the output because "operational activities and regulatory activities are confined to a small contribution to the end product". (Achterbergh & Vriens, 2019, p.77). It is possible that, because of all the (small) disturbances that can occur during the process, there are small variations in the output which, due to the short cycle time, are difficult to repair (Achterbergh & Vriens, 2019, p.77).

Potential for innovation – when parameters have a high value there is a small scope of regulatory tasks and therefore a lack of overview of the production process as a whole. Process innovations which are not just sub-optimizations are therefore difficult to obtain (Achterbergh & Vriens, 2019, p.77). When you look at the regulatory differentiation and specialization, which also have a high value in this situation, an "integrated perspective on product or goal improvements is hard to realize" (Achterbergh & Vriens, 2019, p.77).

2.5.3 Effect of high parameter value structure on quality of work

To show the effect of a high parameter value structure on the quality of work I will describe the effect on every external functional requirement of this organizational criteria. Both low level of absenteeism and low level of personnel turnover are affected by;

The degree to which employees can develop and learn while doing their job –

> ″Functional concentration, separation, specialization, and differentiation result in uninteresting, repetitive operational work with a short cycle time, deprived of regulatory potential. It also results in uninteresting regulatory tasks with a small scope. In such tasks, there is not much to learn. They don't challenge employees to experiment with new ways of doing things and learning, nor do they "mobilize them to the best of their abilities to contribute to the organization's viability"." (Achterbergh & Vriens, 2019, p.78).

The degree to which employees feel involved – the feeling of being socially involved while doing a job comes about if you are being actively involved in a network of social relations associated with the job. The feeling of intrinsically involvement come about if you are able to see the consequences of your actions and having the feeling it can make a difference/is a contribution to the process of producing something (Achterbergh & Vriens, 2019, p.78).

> "Now, as many psychologists and sociologists have established, a lack of social and intrinsic involvement leads to feelings of isolation (a sense of job-related loneliness) and alienation (a sense of job-related meaninglessness), which may turn a job into a dreadful experience. Regrettably, HPVSs have a small, repetitive jobs with a short cycle time and a lack of regulatory potential. Carrying out these small, repetitive activities does not require the active participation in a social, job-related network. At best, you see other people as their repetitive job touches yours. Seeing what one is contributing to, both in terms of the process or of the end product, is virtually impossible because of the lack of overview of the process. Moreover, active intrinsic involvement is also problematic, as most jobs lack the regulatory potential to do so." (Achterbergh & Vriens, 2019, p.78).

The degree to which employees experience job-related stress – in high parameter value structures (HPVS) the probability of job-related stress is high. A job within an HPVS may face many disturbances and, at the same time, lacks the possibility to do something about it because it has no regulatory potential (Achterbergh & Vriens, 2019, p.79).

> "So employees working in such jobs need to realize targets, face many possible problems in doing so, and can't do much about them. Now, as many authors point out, this job situation – facing problems and being unable to solve them – induces job-related stress. In fact, in HPVSs this lack of control is structurally built into a task, hence feelings of stress are unavoidable." (Achterbergh & Vriens, 2019, p.79).

To summarize, employees in HPVSs are doing jobs that are stressful and can feel meaningless to them. In fact, "the gloomy prospect of living a pointless working life beckons " (Achterbergh & Vriens, 2019, p.79). Therefore, HPVSs are not good at realizing quality of work variables (Achterbergh & Vriens, 2019, p.79).

2.5.4 Effect of low parameter value structures on the organizational criteria

In contrast with the high parameter value structures, low parameter value structures are characterized by broad, coherent jobs, which cover the whole process, and have the regulatory potential to deal with the disturbances the moment they occur (Achterbergh & Vriens, 2019, p.92).
Such jobs decrease the production cycle time and therefore enhance the flexibility, which are both variables of the quality of organization variable (Achterbergh & Vriens, 2019, p.92).

Low parameter value structures (LPVS) also enable better control over order realization. LPVS leads to fewer disturbances, and on top of that the workers are enabled to detect and deal with them as soon as they do occur. The overview of the complete process adds that the making of a planning and keeping track of orders is much easier and more reliable. Also, it enables product quality control.

Since workers have an overview and regulatory potential they are able to detect errors in an early stage and have the possibility to repair them in an adequate way (Achterbergh & Vriens, 2019, p.92).

Because of the regulatory integration and lack of operational and regulatory specialization, an integrated perspective on product or goal improvements may be possible. It also provides potential to experiment and learn while performing the job (Achterbergh & Vriens, 2019, p.93).

Besides opportunities for realizing quality of organization variables, LPVS also creates opportunities for realizing quality of work variables. Instead of the involvement in just a small part of the production process, workers are involved in the whole production process and have the regulatory potential to detect and deal with disturbances, this offers learning opportunities (Achterbergh & Vriens, 2019, p.93).

LPVS means that a worker is part of a team which is responsible for realizing a complete (sub-set) of orders and which has a joint regulatory potential. This can lead to members being socially involved. But also having an overview of the complete process can lead to being able to see and appreciate the point of the task they are performing which in itself can lead to intrinsic involvement of the workers (Achterbergh & Vriens, 2019, p.94).

The last way LPVS support the realization of the quality of work criteria is in the probability of job-related stress. This probability is much lower in LPVS in contrast with HPVS. This is the case because realizing targets set for a job is less problematic because you are facing less disturbances and when you do face disturbances you have the regulatory potential to deal with them, because this regulatory potential is built into these jobs (Achterbergh & Vriens, 2019, p.95).

So designing the production structure and the control structure in such a way where the design parameters have a value that, given the context, is as low as possible then the design of the production and control structure contribute to the quality of work and organization.

2.6 Overview of chosen theory

Because of the attention given to quality of work and organization and the pragmatic validity of the integrated redesign chain I chose this theory to continue my research with. Below I will further describe the theory and elaborate on the six steps of the theory.

2.6.1 The integrated redesign chain

The integrated redesign chain indicates which successive steps can be distinguished, how these steps are interrelated and which relevant design techniques can be used in each of those steps (Kuipers et al., 2012, p.283). Looking at structure, the integrated redesign chain explains the conceptually logical sequence of a series of decisions that must be taken in the context of its design. This is only

concerning the conceptual sequences, in practice design is an iterative process (Kuipers et al., 2012, p.283). In the following sub-paragraphs, I will discuss these six sequential steps.

2.6.1.1 Step 1 - scope of the redesign

The aim of this step is to get unequivocally clear which organization, or which part of an organization is the object of diagnosis and/or redesign. A description of what is and what is not part of the scope of the (re)design is being made in this step (Kuipers et al., 2012, p. 284).

Defining the scope is not always that obvious. When a problem occurs in a certain part of the organization there is an inclination to also attribute the problem to that part as well, when this is not necessarily the case (Kuipers et al., 2012, p.286). This means that there is an inclination to draw the boundaries of the scope too narrow.

In an integrated approach the starting point for diagnosis and redesign is at the level of the total system. Starting with the diagnosis and redesign at the level of the total system entails that reasoning is done from the whole system to parts of the system. The idea behind such an approach is that the causes of many problems in organizations are only properly understood when the attention is focused on the structural relations within a system, and on the relations of the system with the environment. Only then you can consider structural relationships between parts of the subsystems (Kuipers et al., 2012, p.284)

Determining the scope can be an iterative process (Kuipers et al., 2012, p. 287). During such an iterative process it is possible to conclude that the scope should be wider or different than the original determined scope. The widening must always lie within the competence of the organization, which means that the scope can only include what the organization itself can still influence (Kuipers et al., 2012, p.287).

2.6.1.2 Step 2 - Environment and mission, goals and strategy

It is necessary to have sufficient clarity and agreement about the direction of the organization before you can take the next steps in the design chain (Kuipers et al., 2012, p.288). As the organization can describe this direction more adequately and unanimously, the design process will provide more guidance (Kuipers et al., 2012, p.288).

From a design perspective, the variability of the environment is particularly important, whereby "variability" is used as a collective term for phenomena such as uncertainty, unpredictability, dynamics, complexity and so on. That is of importance for the design because the variability that the organization wants to respond to, determines the flexibility that the organization must have. So, this has influence on the desired control capacity in all workplaces where one has to cope with that variability every day (Kuipers et al., 2012, p. 288).

Mission the mission describes what the organization wants to be in the future and is based on the raison d'être for the organization and the underlying beliefs (norms and values) (Kuipers et al., 2012, p. 289).

Vision a vision provides an explanation of the mission by outlining future developments in the areas of customers, competitors, labour and technology and the image that important stakeholders (employees, shareholders, society, unions, etc.) have of the organization (Kuipers et al., 2012, p. 289,).

Objectives and ambitions the objectives indicate how continuity can be guaranteed by the desired position and choices. The objectives are determined by the internal ambitions and external necessity (Kuipers et al., 2012, p. 290,).

Strategy the strategy addresses the question of how the objectives of the organization can be achieved and indicates the desired level of performance. The strategy can also provide a (global) picture of the desired organization of structure, culture, systems and people. This image is expressed in:

- The organizational philosophy and guiding principles
- The organizational concept
- The different organizational building blocks;
- The design criteria and frameworks within which the organization can take shape;
- The pursued norms and values;
- The rules of the game in the context of the change process (Kuipers et al., 2012, p. 290)

2.6.1.3 Step 3 - design specifications as starting points

This step is the determination of concrete, targeted design specifications as starting points for the redesign (Kuipers et al., 2012, p. 290). These specifications must be in line and partly derived from the mission, goals and strategy. In a certain sense, it is about operationalizing it in such a way that it can offer concrete starting points for designing the desired organization (Kuipers et al., 2012, p. 290).

It is important to describe the desired primary process, and within this description it is of importance to describe it independent from the current structure, divisions of tasks and procedures of the organization. In this way all options are kept open for the redesign of the new organization (Kuipers et al., 2012, p.291).

According to Kuipers et al., (2012) a primary process does not only contain the manufacturing and/or the service process, but also the preparatory and supporting activities. Because of this definition it is important to look at the primary process in three ways:

1. The primary process as an order flow

2. The primary process as a pattern of interrelated activities required to fulfil orders

3. The functional requirements for the manner in which the primary process must be carried out (Kuipers et al., 2012, p.291)

Every way can be a source for the in this step desired design specifications.

The primary process as an order flow can be a source for the design specifications. Orders can differ on many characteristics. It is important to map the differences on all potentially relevant characteristics before choosing certain sorting principles. Relevant order-related characteristics can be production-technical, but they can also relate to customers. In a view of a good design one chooses those sorting principles that lead to the simplest structure of units operating in parallel (Kuipers et al., 2012, p.294).

When the overall pattern of activities becomes too complex or extensive for a task group, a form of distribution is necessary. Creating a segment can be a form of such a distribution. Segments are defined as clusters of activities allocated to organizational units at meso level (Kuipers et al., 2012, p.296).

The last way that can be a source for the design specifications are the functional requirements. They mainly provide starting points for the design of the desired control structure (Kuipers et al., 2012, p.296). Functional requirements are requirements in the field of manageability, flexibility, innovative capacity and quality of work and working relationships, which the organization must be able to meet when processing the orders (Kuipers et al., 2012, p. 296).

2.6.1.4 Step 4 - structure design

When design specifications are clear, a new design for the structure can be made. The design specifications give an overview of what the organization must be able to perform. The following process of designing a new structure is most of the time a very creative process where the designer searches for design solutions that meet the design specifications as much as possible. Despite the design process being a creative process there is one 'rule' to follow, namely to design the production structure before the control structure (Kuipers et al., 2012, p.297).

Production structure means grouping and linking all activities of the primary process. These are all the preparatory, support and executive activities required to execute the orders. Control structure means the grouping and linking of all administrative or regulating activities that are necessary to control the primary process. The answer to the question of how to best organize the control structure depends on the question of how the production structure is set up. You must first know what needs to be controlled (object of control) before determining which administrative or regulatory activities are required (Kuipers et al., 2012, p.298).

The production structure must be set up from macro, via meso to micro. In this way you can ensure that when grouping and linking the activities of the primary process, at the level of the unit and of the segment, the work is divided up as little as possible in order to create as few interfaces between the

units as possible (complexity reduction in the interaction network). And that means that the need for control across the boundaries of macro- and meso-units respectively is drastically reduced, while the control power within the units can be increased drastically. Within the units everything needed to make a complete (part of a) product is bundled. Every interface that you have created within the production structure requires coordination. Therefore, the control structure must be designed from micro to macro. The new production structure is the starting point and the aim is to place the control capacity where necessary close to the primary process and integrate it there. This in turn leads to complexity reduction in the organization as an interaction network (Kuipers et al., 2012, p.299-302).

2.6.1.5 Step 5 - the (technical) systems

The systems used in an organization must be congruent with the structure. Therefore, the fifth step is to set up the (technical) systems in accordance with the chosen structure. An example of a system is an individual system where performance is rewarded, this can be stimulating or counterproductive for a fruitful cooperation of a team (Kuipers et al., 2012, p. 308).

According to their functions, systems can be divided into production systems (for manufacturing, conversion, transport), preparation systems (for work preparation, logistics, production planning), support systems (for personnel, maintenance, quality, finances) and information systems (for registration, processing and transfer of information) (Kuipers et al., 2012, p. 308).

A system which is missing in the book of Kuipers et al. (2012) in this step is the building of the organization. A building can be an impediment to a new designed structure, but when redesigned it can also add something to the new structure. For example, certain walking routes that make the flow of the organization easier, machines that fit better in the space, or more spaces in which other (technical) systems can be used in order to support the new structure. As soon as you have a new structure you could think about the building. How many rooms should there be? Which departments will you put together? Who should consult with whom and what is a logical place then for them in the building? Do you divide the building according to expertise or subject? These are all question you could ask regarding the building of an organization, and when thought through could support the new structure design (Jacobs & Chase, 2016; Migchels, 2016).

2.6.1.6 Step 6 – the development of behavior, mentality, culture and leadership

Kuipers et al say little to nothing about the last step of the integrated redesign chain, except for that it exists. It is about development of behavior, mentality, culture and leadership but also about the implementation of the new structure and ensuring that it works. This step brings out the soft side of the design. For example, there is a possibility for different behavior of managers after decentralizing the control capacity, there are other performance indicators and employees can take more responsibility (Lekkerkerk, 2017).

3. Methodology

The main goal of this research is to find out how the structure of primary school SamSam can be redesigned in order to improve the quality of work and organization and reduce the high work-related stress. This is in essence a design issue and therefore also the reason why I am going to apply a design research methodology to it. In this chapter I will elaborate on the content of a design research methodology and on the research setting, method of data collection and analysis and the research ethics.

3.1 Research strategy

Design research focusses on the 'messiness of real-world practice' and involves multiple dependent variables instead of only a couple of dependent variables (Barab & Squire, 2004, p.3). It thus focuses on characterizing the situation in its complexity (Barab & Squire, 2004, p.4). Also, design research intends to provide useful input for the design, in order to improve the chances of success of the concerned organization (Laurel, 2004). The term design research has two components: design and research. Design is defined as devising and developing a solution to a problem in a systematic way. In this context, research is a systematic study of the qualities of the solution that result from the design (van den Berg & Kouwenhoven, 2008, p.20).

Translated to this thesis it means that the primary school SamSam is taken into account as a whole, and will be looked at in its real-world practice, not just focusing on a few variables of the school. Creating a new design for the structure of SamSam would be a way of devising and developing a solution to the problems concerning the educational sector as mentioned in the introduction.

The solution to the research question, i.e. the new design for the organizational structure, is conceived and developed in a systemic way using the seven parameters of de Sitter. The intervention cycle of Achterbergh & Vriens (2019) will also be partly used to come to a solution. The intervention cycle describes four phases of an intervention: diagnosis, design, implementation and evaluation. Due to the time tied to this thesis project, I will not be able to implement and evaluate the design but I will carry out the diagnosis and design phase. In the phase of diagnosis it is about finding problems and their structural causes and formulating a solution space (Achterbergh & Vriens, 2019, p.7). Design is about finding a structure that allows to deal with the problems and/or their causes (Achterbergh & Vriens, 2019, p.7).

The difference between a design study and a design process is a theoretical basis made explicit by a literature study. The literature study can help provide design principles which are criteria set up for the design that are based on related scientific literature and certain properties of the primary process (van den Berg & Kouwenhoven, 2008, p.21-22; Kuipers, Amelsvoort & Kramer, 2012, p.36-37). Literature research is the most important way to articulate and substantiate the theoretical principles of a project.

Findings from literature research ensure that the design research is linked to what is already known about the topic of the project. In other words, a good literature review is necessary to incorporate the most recent insights into the design principles. (van den Berg & Kouwenhoven, 2008, p.22).

In design research it can be important to make use of inspiring examples in addition to a literature research, or in other words use reverse engineering. Reverse engineering can be defined as analyzing a product to identify the design requirements (van den Berg & Kouwehoven, 2008, p.23). It is about the recognition of meaningful patterns in already existing structures (Wills & Newcomb, 1996, p.7)

Because the situation around covid-19 and the restrictive measures at that time made it irresponsible to meet physically. Due to the outbreak of covid-19 SamSam was busy making necessary changes to their daily work routines to keep the school running and so there was little time and space left for the team to get together with me, also via the digital channels. Because of the time limit for this thesis project and the situation around covid-19, I chose an alternative for the participatory process. I have taken a directive role as researcher. This contains that I brought my own conceptual models and techniques I saw fit in order to answer the research question (Achterbergh & Vriens, 2019, p.317). In this situation the diagnose phase contained looking in existing literature to get a clear overview of already existing ideas for an alternative structure for primary schools. I have used this knowledge for inspiration and to make an overview of the advantages and disadvantages of these alternatives. As the researcher I initiated the study, and I closed the study by reporting back the results and recommendations to SamSam (Rouwette & Franco, 2015, p.42).

For the diagnose phase I used SamSam and two primary schools with an alternative structure: Laterna Magica and De Verwondering. I diagnosed the production structure of these three schools using the parameters of de Sitter. The parameters are the basis for a design with the aim of lowering higher quality of work and organization values. If lower values cannot be found in the example schools, then the process seems to stop.

Laterna Magica does not work with the standard group formation, but instead there are multiple units within the school to which children are linked. Within these units they perform their own tailor made curriculum (Schouwenburg, 2015). At De Verwondering children are grouped in so called 'leerpleinen'. There are three 'leerpleinen' which are divided based on age, however the age classification is only indicative. The development of the child in cognition and social field is the most important determinant of which 'leerplein' the child will be placed in (de Verwondering, 2020).

Summarized, I will diagnose the production structures of all three schools (Laterna Magica, De Verwondering and SamSam) using the parameters of de Sitter. In this way they can also be compared with each other. The difference in values on the parameters, caused by a different structure, I use as inspiration for the new design of SamSam.

3.2 Research setting

In this research I will work together with primary school SamSam. Primary school SamSam is perfectly fit for this research because within two years they will move to a new building where they on forehand have to come up with a program of requirements for the new building. As mentioned in the fifth step of the integrated redesign chain in chapter 2, the new design can lay the foundation for what an organization's building should look like. Therefore the new ideal design for the organizational structure can be used for the foundation of their program of requirements.

The research school SamSam has a fairly standard structure for a primary school. The school consists of a management team (MT), teachers and support staff. The MT consists of the headmaster, 'onder – en bovenbouwcoördinator' (OC & BC) and the team is sometimes extended with two 'Intern Begeleiders' (IB'ers). The headmaster is responsible for the policy and daily affairs within the school. The OC and BC are the first point of contact for matters concerning the building, facilities and teaching methods used for the school subjects. The IB'ers help teachers with children who need special care and they maintain external contacts with care institutions (basisschool SamSam, 2019, p.10).

In addition to the MT, there are the teachers who teach and are responsible for their own group. Among the teachers in the school hierarchy are the teaching assistants, they support the teachers in the group and provide additional support for the children. Other support tasks are carried out by (1) the janitor who carries out all common tasks at school, and (2) the administrative assistant who takes care of the administration of the children and financial administration. There are also several volunteers working in the school, who for example support the teacher or help the janitor (basisschool SamSam, 2019, p.10).

3.3 Method, Data collection and Analysis

For the diagnosis, I compared three schools based on their production structure. In order to do this, I used the school's own documents such as the school plan and the school guide. I also used the book of Schouwenburg (2015). In his book Schouwenburg analyzed several primary and secondary schools with an alternative structure and combined the results to inspire other schools. The two schools I used for inspiration are also in this book. Via SamSam I had access to more documents and was able to make a more detailed diagnosis of their structure. The extra detailed information makes for a better aligned new design for their structure.

The prediction was that the first two primary schools will score different on the parameters than SamSam will and also score different among themselves. Therefore this could be a source of inspiration for the new design of SamSam (this is what I earlier called reverse engineering).

When the diagnostic part was finished I started with the first four steps of the integrated redesign chain of Kuipers et al. (2012) as discussed in the theoretical framework. Because it was not possible for me

to have a participative process to do so, I took a directive role here too. That means that based on the literature study and the comparison made in the diagnosis phase, I performed these steps from an expert role. This means that my design constitutes an advice with regard to content, whereas if I followed the participative approach I would follow the process together with the school to come to a design together (Rouwette & Franco, 2015, p.25).

1. Determining the scope of the redesign
2. Create clarity about the surroundings and mission, goals and strategy
3. Come up with design specifications as starting points
4. Structure design
5. Set up the (technical) systems in accordance with the chosen structure
6. The development of behavior, mentality, culture and leadership

For the fifth step I chose to only look at the building and not at the other (technical) systems within the organization because within this context of a primary school the (technical) systems do not require strict design specifications. The primary school is a relatively small organization where the primary process is not that much dependent on technical systems. The building however does require more strict design specifications. It is useful to say something about this since part of the motivation for this research was that SamSam is going to build a new school building and therefore needs input for their program of requirements.

The sixth step will not be included in this research. This is a step which fits best with an implementation and/or evaluation phase, which I cannot carry out due to time limits.

Later on in chapter 4 I will work out both the diagnosis and the design. In the design part I have split up the process into different segments. The segments that are identified are in the main lines the same, so therefore because of scope and time limits I will not go into detail for all the segments. For one of those segments I followed the first five steps of the integrated redesign chain. Because of the great similarity between the segments the idea of an ideal structure has become clear, and therefore a detailed elaboration on all the segments was not necessary.

3.4 Research ethics

Within this section I will discuss the ethics of this research. In the research of Bell and Bryman (2007) there are eleven categories of ethical principles identified. Because of my expert role within this research instead of a participative process not all eleven principles are applicable. Therefore I selected the most important ethical principles where my research should be in line with. Below I summed up

the three most applicable ethical principles with a brief explanation as given by Bell and Bryman (2007).

***Confidentiality* – the requirement to ensure confidentiality of research data whether relating to individuals, groups or organizations** (Bell & Bryman, 2007, p.71).

Confidentiality is about the protection of information supplied by research participants (Bell & Bryman, 2007, p.69) For my research this concept is important because I did not speak that much with employees of the primary school but instead analyzed (some confidential) documents provided to me by the headmaster of the school. Confidentiality can in this case also be seen as the protection of the confidential information within the documents about the employees of SamSam. In order to create a new design whereby everyone feels as comfortable as possible it is important to adhere to this principle. This means that in the analysis of the organization as well as in the process of assigning new activities to capacities I will only give a general description.

***Reciprocity* – the idea that the research should be of mutual benefit to researcher and participants or that some form of collaboration or active participation should be involved** (Bell & Bryman, 2007, p.71).

The reciprocity of this research can be found in the fact that SamSam will move to a new building where they on forehand have to come up with a program of requirements for the new building. A new design can contribute to their program of requirements.

***Honesty and transparency* – the need for openness and honesty in communicating information about the research to all interested parties, including the need for trust** (Bell & Bryman, 2007, p.71).

In order to be transparent I on forehand discussed with the contact person of SamSam what my research would contain exactly. Besides the informed contact person on forehand, I had frequently contact with SamSam so misunderstandings could be quickly picked up, cleared up and be dealt with. Also, to my regret, I had to let them know from time to time that there was a delay in the process, they have been informed about this as well.

4. Results

This chapter contains the diagnosis of the structures of the three primary schools and the new structure design for SamSam. The diagnosis consisted out of understanding the organizational structure using the seven parameters of de Sitter. I made a rough estimation of the values of the parameters, using labels as 'low', 'medium', high', with a short explanation why I chose this label. For SamSam I did a full diagnosis of all the seven parameters by de Sitter. Because there was not enough information to be found on how the control structure of the two other schools was designed I did not diagnose the control structure for those two other schools. In subsection 4.5 the design steps which are used to come up with a new organizational structure design for SamSam will be shown.

4.1 Diagnosis of SamSam

Because SamSam is the research school I will start with a general introduction of the school. This will eventually be followed by the specification of the parameters and a schematic overview of production and control structure.

4.1.1 Introduction to the structure of SamSam

SamSam is a primary school that is located near Nijmegen in the Netherlands. There are about 300 children at the school and they are divided over 15 groups. SamSam has 25 employees of which 22 are teachers, and some of the teachers have a double role. The (intern begeleiders) IB'ers and the onderbouwcoördinator (OC) and bovenbouwcoördinator (BC) both teach and are responsible for carrying out their ambulant tasks. The headmaster, administrative employee and *'coördinator TSO'* (coordinator of after school care) do not teach in addition to their function.

In addition to the tasks that are directly related to a position, there are also tasks that are not. These are tasks that do not fit a certain function and are therefore subdivided among all employees (SamSam, 2018, p.37). Examples of this kind of tasks are organizing school trips, supervision of the schoolyard or the supervision of interns (IB'er SamSam, personal communication, July 7, 2020)

The classification of the children is made on the basis of eight groups, each child goes through group 1 to 8 before leaving the primary school. Despite the division over 8 groups, there are still a total of 15 groups on SamSam. This is due to the number of children on SamSam. In the *'*bovenbouw*'* there are some parallel groups and some combination groups. Parallel means that there are too many children for, for example, one group 7, so it is divided into two groups 7. A combination group is for example a mix of group 7 and 8. The combination group is partly because of the number of children that are in that phase (it is too much for one group but not enough for two parallel groups) and partly because of educational benefits.

Further on I will continue the diagnosis of SamSam. This is done using the seven parameters of de Sitter. For each parameter I will show if SamSam has a high, medium or low value of that parameter in their current structure.

4.1.1.1 Functional concentration

The degree of functional concentration is high within SamSam. Within the primary school there are several order types. The children within the school that are being prepared for secondary education can be seen as the order, where the different order types are the three different levels of education they will be prepared for: 'vmbo', 'havo', 'vwo'. This difference in order types is linked to the primary activity of SamSam. Within SamSam they work with '1-zorgroute' which means that lessons are taught from a 'three-way approach'. There are three types of instruction given to children who are clustered in groups of extended, basic or shortened instruction (*Basisschool SamSam Schoolgids 2019-2020*, 2019, p.20). Those three types of instruction can be indirectly linked to the three levels of education that the children are being prepared for. It is not necessarily the case that a child gets the extended instruction on every subject, it can differ per subject. In any case, at the end the children are divided over these three levels of education, and this is done on the basis of which 'zorgroute' they have had to follow and their performance. For example, if they had to get the extended instruction on almost every subject it is most likely that they will continue at the 'vmbo' level at the secondary school.

A teacher within SamSam is responsible for one group of children. SamSam works with the 'leerstofjaarklassensysteem' which means that per group there is identified what kind of matter per subject there can be teached. A teacher is therefore related to only a small subsegment of the whole primary process because it only teaches the subject matter of the specific group. In this situation the teacher has little overview over the whole primary process. Also a teacher is related to all order types, which means that the operational tasks that a teacher has to perform is related to all order types. As seen in the theoretical framework this means that the organization has a high value on this parameter.

4.1.1.2 Operational differentiation

The degree of differentiation of operational tasks has a medium value within SamSam. This parameter is about the differentiation of preparing, making and supporting. Preparing and making is mostly combined within the job of the teacher. Preparing includes preparing of the lessons both on content and physical preparation such as making copies and host parent/caregivers meetings. The making is teaching the different classes (headmaster SamSam, personal communication, April 4, 2020). Supporting activities are differentiated to the IB'ers. The IB'ers coordinate and guide children that require extra care, also they support and advise the teachers in the use of special teaching aids. They coach and give guidance to new teachers, and in general they are a source of information for the teachers, teachers can turn to them with questions. Also they advise and support teachers in conducting parents/caregivers meetings (headmaster SamSam, personal communication, April 4,

2020). Making a schedule for the different subjects is done based on the split of 'onderbouw-bovenbouw' and is done by the OC and BC.

As put in the theoretical framework organizations who have the activities grouped into separate making, preparing and supporting tasks have a high value on this parameter, a low value is assumed when the activities are all grouped together into one task. Because in this situation two out of three are coupled and the third is differentiated to another task SamSam has a medium value on this parameter.

4.1.1.3 Operational specialization

The degree of operational specialization within SamSam is high. Within SamSam they work with the 'leerstofjaarklassensysteem', where children get grouped mainly based on their age (*Basisschool SamSam Schoolgids 2019-2020,* 2019). The subject matter is a starting point of the 'leerstofjaarklassensysteem' and the basic principle is that the same performance requirements can be imposed on children of the same age ("Leerstofjaarklassensysteem - uitleg jaarklassensysteem", z.d.). Within SamSam they make a distinction between type of instruction that a child requires but the subject matter is the same for the children within the same group. A teacher is responsible for one group and therefore specialized in the learning material assigned to that specific group.

This parameter had a high value when the operational process is split up into segmented flows where the process is split up into sub-activities and have them allocated to separate tasks. The operational process of SamSam is preparing children for secondary education and this is done by teaching. The operational process is split up into eight groups which have to be followed to come to the end state of the process. Those eight groups are allocated to separate tasks in the way that per group there is a teacher or a set of teachers responsible for providing lessons.

4.1.1.4 Separation of the production – and control structure

There is a large separation between the production structure and the control structure within SamSam. At the lowest level there is regulatory power assigned to the operational activities. The teacher monitors the children during his or her lesson and assesses at that moment what is needed to keep the lesson running, and will act accordingly. This happens without the intervention or consulting of a colleague. So for example, the teacher will check whether there are questions about the learning material and assesses on the basis of the type of questions whether additional instruction on the topic is necessary.

At a higher level, where it is not just about that one specific group, but about the bigger picture (concerning the whole school) the teacher has monitoring and a part of acting as only regulatory activity. This will be considered in the elaboration of the next three parameters. The management team does not execute operational activities, except for the ones with a double role, and frankly all the other regulatory activities are assigned to them.

4.1.1.4 Differentiation of regulatory activities into parts

The degree of differentiation of regulatory activities into parts has a medium value within SamSam. This parameter consists out of monitoring, assessing and acting activities.

Monitoring refers to gathering information with respect to indicators which define what should be monitored. Within SamSam the teacher monitors the children within the group they are responsible for. The teacher monitors and assesses the educational activities of the children. Assessing includes a comparison of the indicator values with norm values and a judgement with respect to their difference. The IB'er is responsible for analyzing test results and making recommendations. At group level the IB'er is responsible for analyzing test results from children who need extra care. At the school level the IB'er is responsible for analyzing test results from the segment ('onderbouw' or 'bovenbouw') that they are responsible for and compare the results with the norm values of the school. This means that the IB'er performs the assessing activity but does also a part of the 'acting' activity, namely coming up with a plan for acting, this is the recommendation they come up with. The actual execution of the recommendation is done by the teacher. Therefore this parameter has a medium-high value. Monitoring, assessing at the group level and a part of acting is done by the teacher, assessing at group level and school level as a part of acting is done by the IB'er.

4.1.1.5 Differentiation of regulatory activities into aspects

The degree of differentiation of regulatory activities into aspects has a low value within SamSam. Strategic regulation, design regulation and operational regulation is assigned to the MT, which consists out of the headmaster and the BC and OC.

The operational regulation is for example the arranging replacement for sick colleagues. Strategic regulation is done by the management team by setting goals and a course for the organization. Who is part of the organization (HR) and what should be integrated in terms of IT, thus the regulation by design, is also in the hands of the MT (Wonderwijs, 2019). Choosing a new method for a particular subject/course is often done on the basis of advice and input from the teachers, but the power to decide which method it will be lies with the MT.

4.1.1.6 Specialization of regulatory activities

The level of specialization has a medium value within SamSam. SamSam is split up into two segments the 'onderbouw' and 'bovenbouw'. Within the management team there is a decomposition of the regulatory activities based on these two segments. Bothe the OC as the BC have care for their teachers, those who are linked to their segments and also have a role in the educational innovations within their segment. One of the coordinators is in charge of the interns, the other coordinator is in charge of the facilities needed, so facility management. Matters concerning housing and HR are regulatory activities which are assigned to the headmaster. The hiring policy and determining the school hours at which teachers should be present is assigned to the whole management team. This means that there is a specialization within the management team on different regulatory subjects. Yet

the specialization is minimum and the regulatory scope of the specialization is mostly over the whole organization. This is different in the split of regulatory tasks between the OC and BC, where the regulatory scope covers the two different segments of the school. SamSam thus has limited regulators under supervision and a broad scope in terms that regulators cover a large part of the operational process.

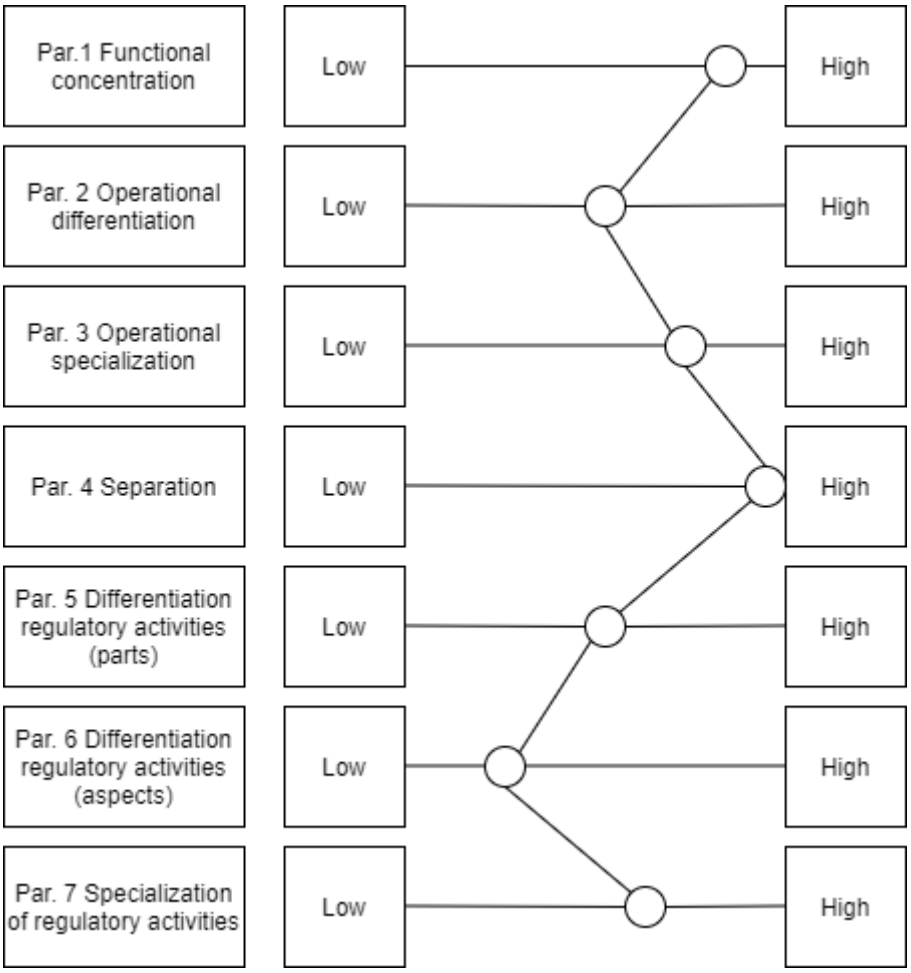

Figure 1- overview of the parameter-values of SamSam

4.1.18 System of SamSam

When defining the order in this situation I chose to select the children to be the order. Children with different educational levels, according to the division made by secondary education, are then the order types. That way the focus of the primary process is about the education. The secondary schools within the society than can be seen as the customers of the organization. Because of the secondary school being the customer and because their division made on educational level, the three educational levels: 'vmbo', 'havo', and 'vwo' are the order types.

The input for the system consists out of children from the neighbourhood. During the time spend by the children on the primary school they develop to their maximum potential. The label of which educational level gets clearer over the years and is finally established after the final test in group 8, that is what you can see at the output.

Figure 2 shows the production structure of SamSam at group level. This means that it shows which preparatory, supporting and making tasks are performed per group. This applies to each make block that can be seen in the larger overview of the production and control structure in figure 3.

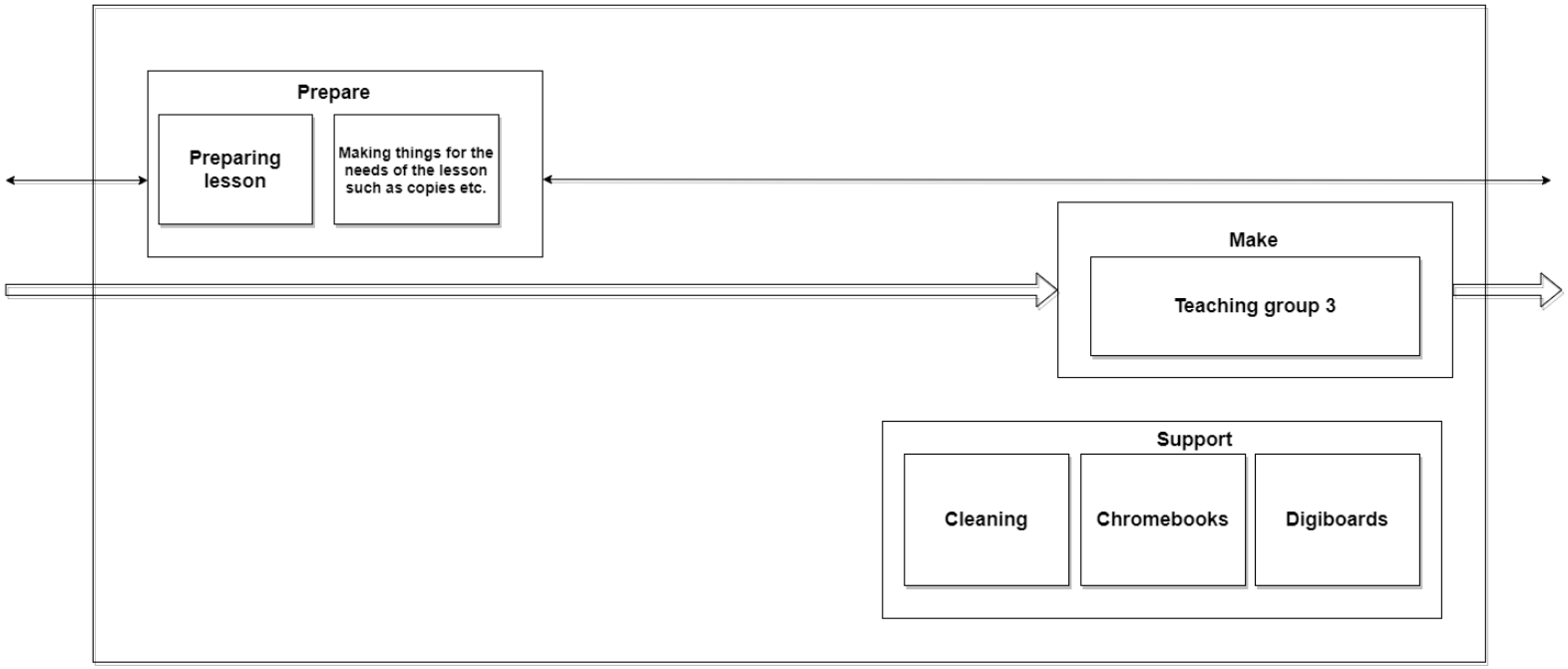

Figure 2- overview of current production structure of SamSam on group level

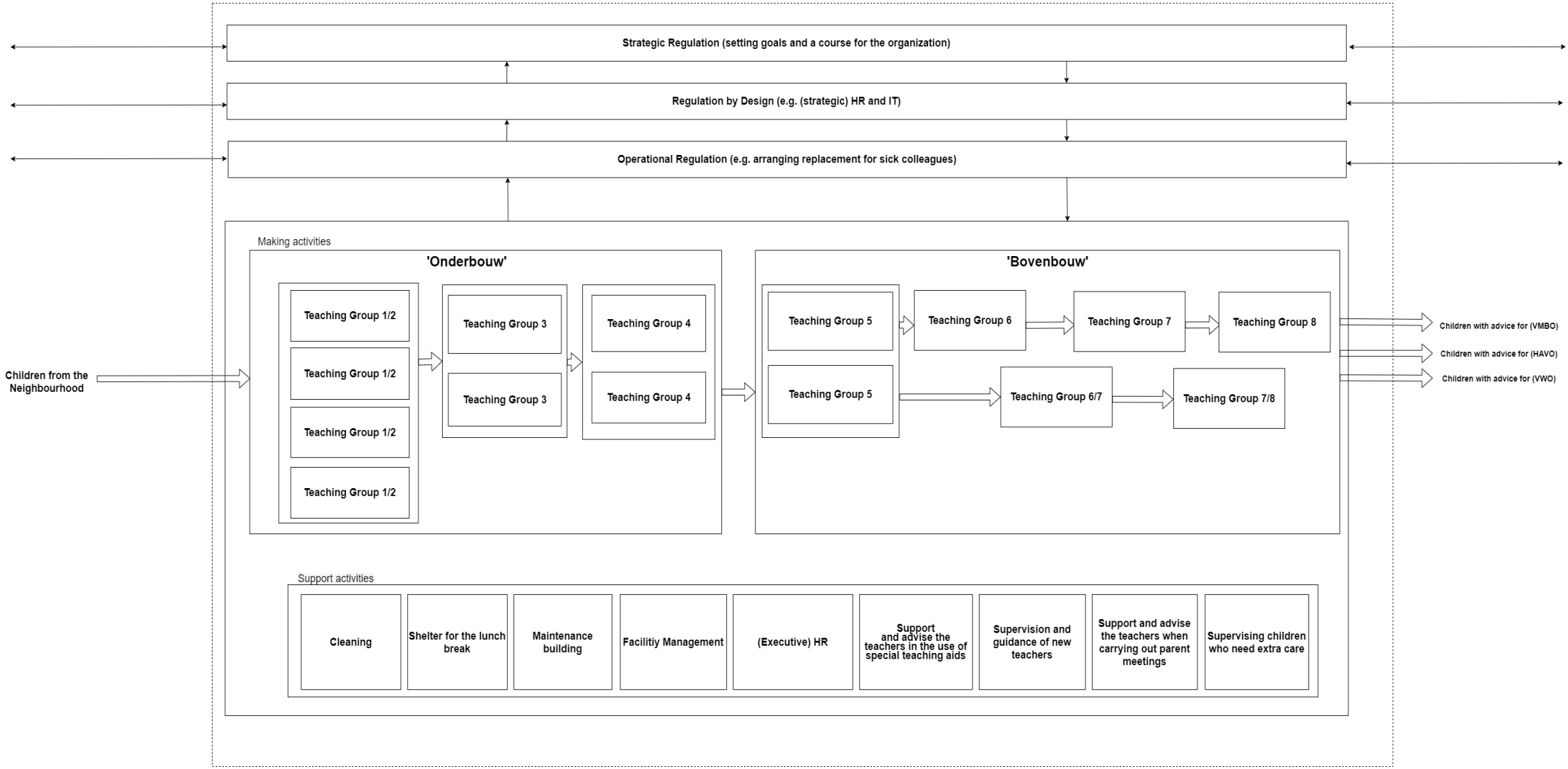

Figure 3- overview of current production structure and control structure of SamSam

4.2 Production structure of De Verwondering based on three parameters of de Sitter

As indicated in chapter 3, there will be no analysis of the control structure of De Verwondering. This means that only an analysis of the production structure of De Verwondering is done. This is done on the basis of the parameters related to the production structure: functional concentration, operational differentiation and operational specialization.

4.2.1 Functional concentration

The degree of functional concentration has a high value within De Verwondering. When children within the school that are being prepared for secondary education can be seen as the order, the three levels of secondary education can be seen as the order types. At De Verwondering they work with three different 'leerpleinen'. The 'leerpleinen' can be seen as segments, consisting of different phases. The total system consists of 16 phases ('leerplein' 1: 6 phases, 'leerplein' 2: 4 phases, 'leerplein' 3: 6 phases). The phase indicates the phase of development for a certain subject. In addition there are groups within 'leerpleinen'. A group is the composition of children with whom the children start their day with and who are supervised by a mentor. Teachers are connected to a 'leerplein' and teach all subjects. Besides teaching, teachers are also mentors of a group within their 'leerplein'. The mentors work intensively together with each other within the 'leerpleinen' and are jointly responsible for the development of all children (Verwondering, z.d.). The 'leerpleinen' are based on age and not on educational level. This results in the situation where a teacher of a 'leerplein' is related to all order types, which means that the operational tasks that a teacher has to perform is related to all order types.

4.2.1.2 Operational differentiation

Operational differentiation has a medium value within De Verwondering. Preparing and making are mostly grouped together and assigned to the teacher, where supporting is mostly done by others. Preparing of the lessons is done by the different 'leerpleinen'. So it is spread over the team of teachers of a 'leerplein'. The preparing is done according to the methods they use and in consultation with the children, who formulate their own research questions. The making, i.e. the teaching is done by the teachers themselves. An example of a supportive task is serving the children with needs for extra care, this is done by the headmaster, 'leerpleincoördinator' and where possible by the mentor of the child (*Basisschool De Verwondering Schoolgids 2019-2020, 2019, p.22)*.

4.2.1.3 Operational specialization

The degree of operational specialization within De Verwondering has a medium value. The children are grouped per subject and the division is adapted based on their educational level. It is possible to be in phase 3 for one subject and in phase 4 or 5 for another subject. The operational process is the preparing of the children for secondary education, which is accomplished through teaching. Within De Verwondering the operational process is thus split up in three major 'leerpleinen'. These 'leerpleinen' are allocated to separate tasks in the way that per 'leerplein' a set of teachers is responsible for providing lessons.

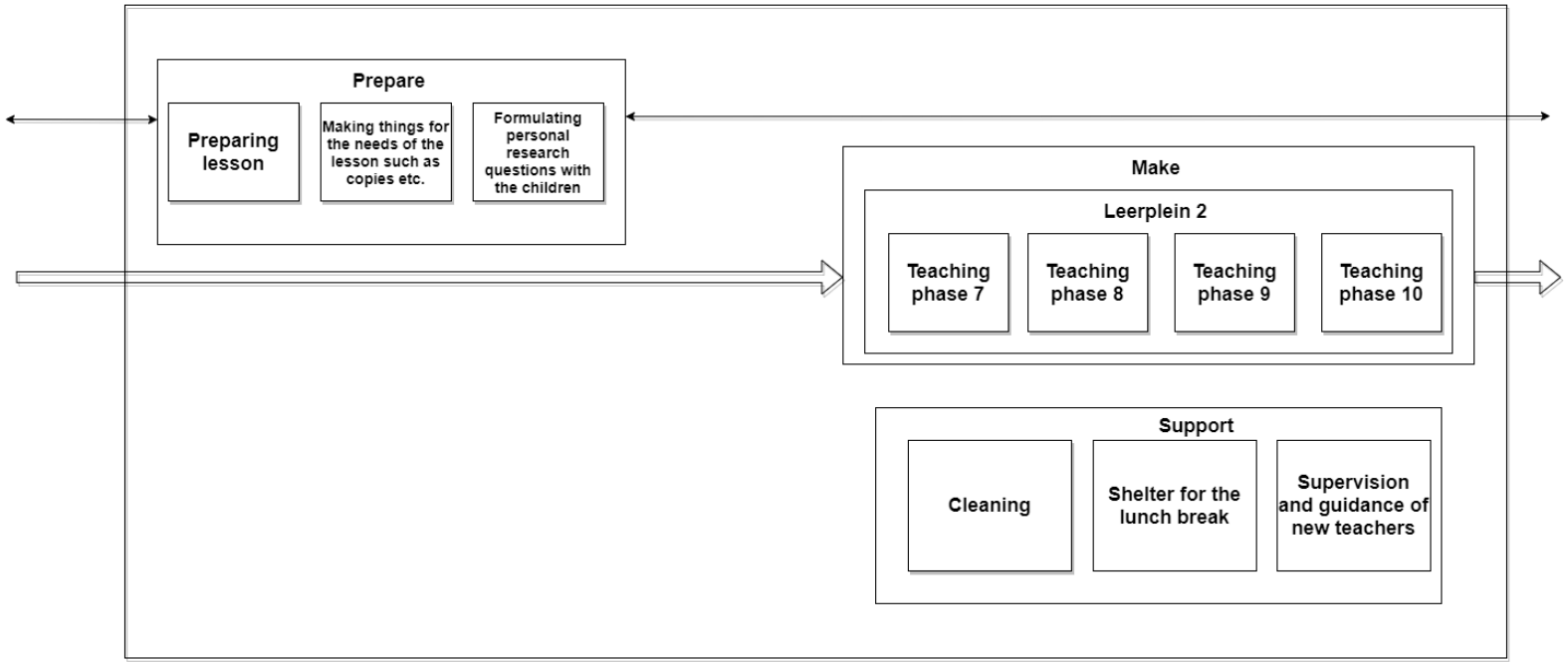

Figure 4- overview of current production structure of De Verwondering on group level

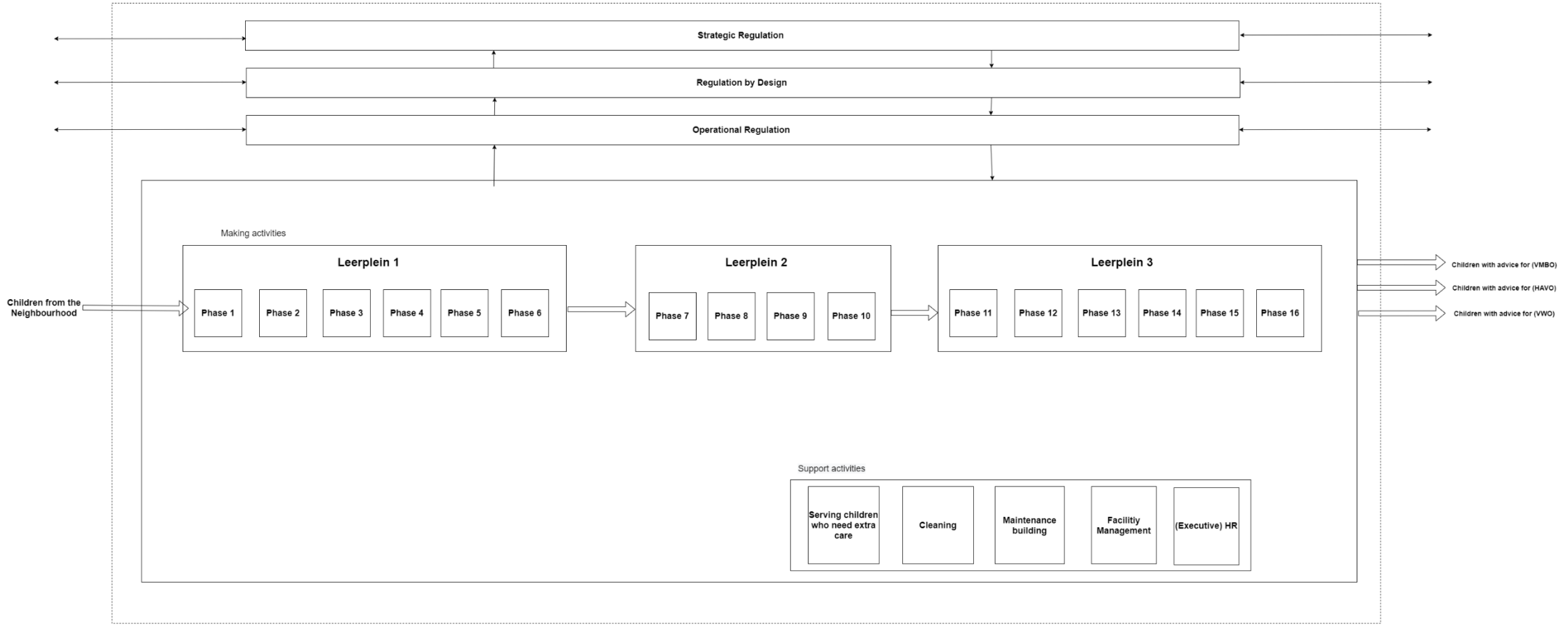

Figure 5 - overview of current production structure of De Verwondering

4.3 Production structure of Laterna Magica based on three parameters of de Sitter

The primary process within Laterna Magica differs a little from the other two schools. This is because Laterna Magica is not only a primary school but in fact is a so called 'integraal kindcentrum'. Children from 0 – 12 years go to Laterna Magica for education, play and discovery. It is a 'kinderdagverblijf', after-school care and primary school in one. So the primary process is not only preparing children for secondary education but also supporting and guiding in the learning of life skills (*Laterna Magica Gids, 2019, p.10*.

4.3.1 Functional concentration

Laterna Magica consists out of three types of units, one for 0-3 year olds, one for 3-8 year olds and one for 8-13 year olds. The school is divided into 8 units with approximately 100 children per unit, this means that for the three units identified there are some parallel units within that age group. Each unit has an interdisciplinary team. Coaches are linked to only one subunit and the specialists are linked to multiple subunits (Schouwenburg, 2015, p.49).

Each child has its own curriculum/portfolio and can therefore be seen as a separate order type. Per unit there is a team of about 10 coaches, each coach is linked to a few students with whom they determine the personal curriculum together. The coaches guide the children in their development and follow these developments. The specialists give workshops in their field of expertise that children can join if this fits with their personal curriculum (*Laterna Magica Gids, 2019, p.18*).

As such, the functional concentration has a medium value for the coaches. With a team of other coaches they are involved with 100 different orders. For the specialists the functional concentration is medium-low, because they are related to all order types but only have the operational task of teaching their specialism. This can be seen as an organizational unit which has its own personnel and equipment dedicated to its 'own order type'. Namely the development of a child in the field of their specialty from beginning to end.

4.3.2 Operational differentiation

Operational differentiation has a medium value within Laterna Magica because preparing and supporting activities are mostly done by the team that is responsible for one unit. The making activities are mostly done by the specialists. Preparing is composing the curriculum of the child. The support activities are mainly about guiding their own group of children and helping them to see where opportunities for development lie. The making is the workshops that are given to the children, this is separate from the unit and is done by the specialists.

4.3.3 Operational specialization

Operational specialization has a medium value within Laterna Magica. As a coach you are involved with the whole process of a child, but that involvement is limited to the unit. So when the child switches from unit after four years, the coaches are involved with other ‘orders’. This only counts for

the coaches and not for the specialists. The subject specialists have a low value within *Laterna Magica*, as they teach all learning material to all orders (*Laterna Magica Gids, 2019, p.10*).

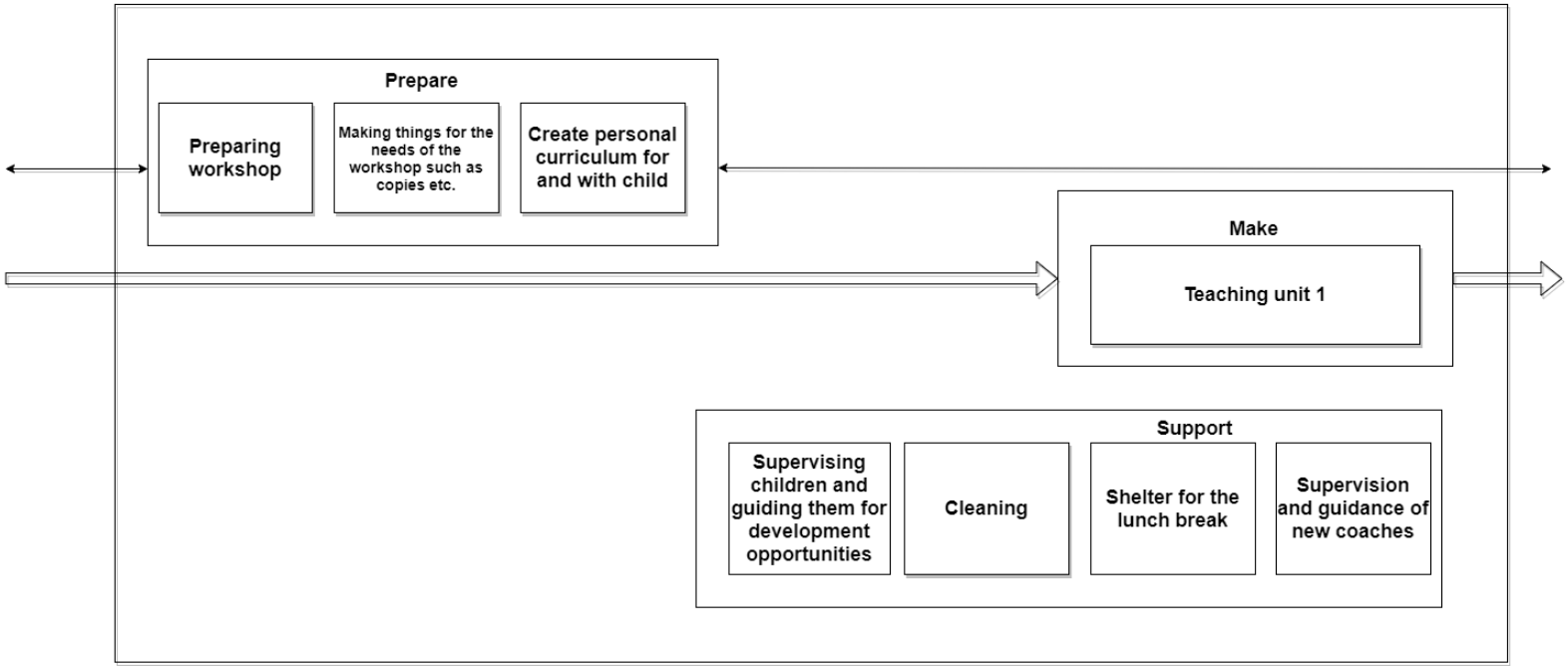

Figure 6 - overview of current production structure of Laterna Magica on group level

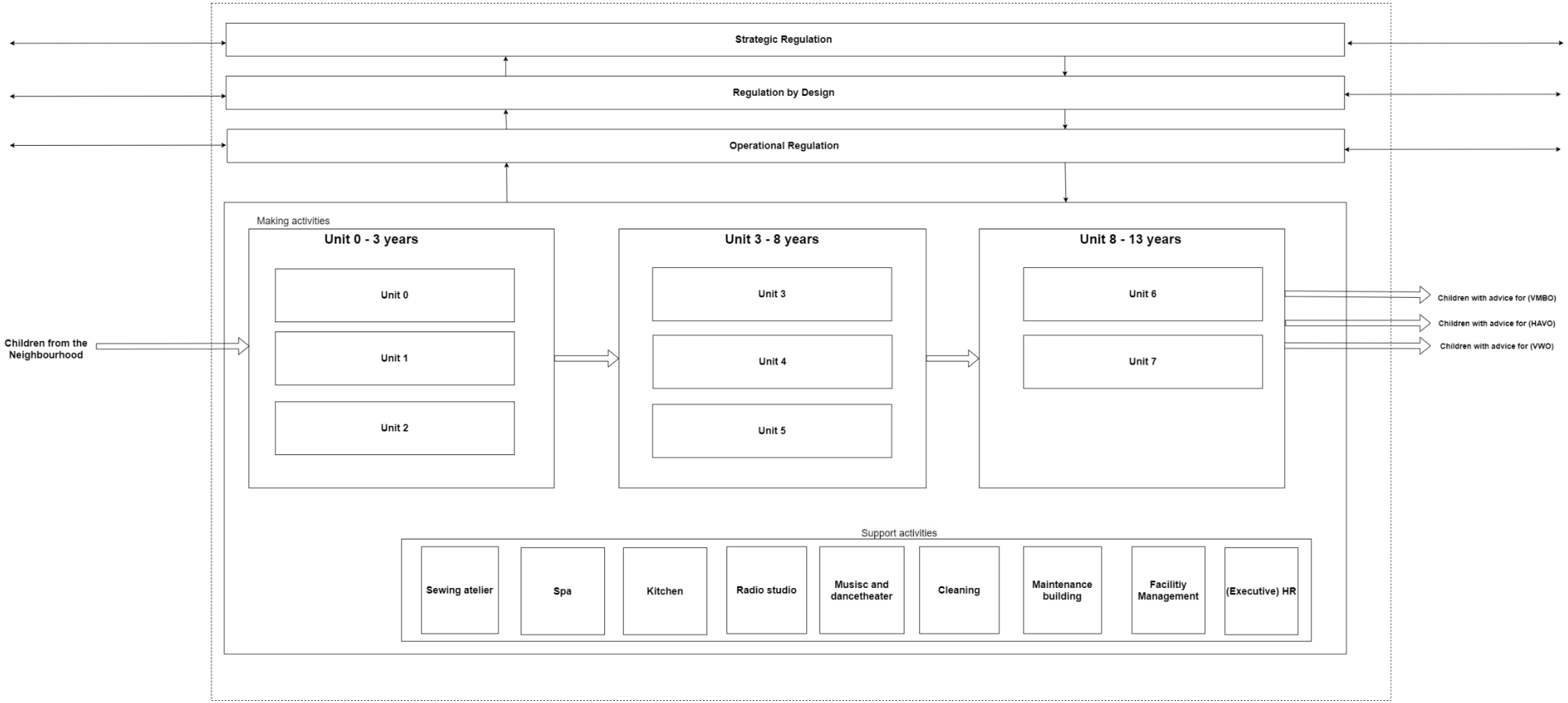

Figure 7 - overview of current production structure of Laterna Magica

4.4 Summary diagnosis

What stands out from the diagnosis is that every school works with segments, most of which are based on age. De Verwondering works with sequential phases that are quite similar to the sequentiality of the SamSam 'leerstofjaarklassensysteem'. The difference between the two is that there is more flexibility in De Verwondering because children can be in a different phase per subject. 'Leerplein' transcending can't be done; so the phase in which the children are, has to be offered within the concerning 'leerplein'. Laterna Magica does not work on a clearly pre-planned sequentiality, except for changing units based on age. Where De Verwondering, compared to SamSam, can already give a more personal offer to the children, this is even more so with Laterna Magica. What also stands out is that with Laterna Magica there is much more variety in the supporting material. Besides blackboards and laptops that support the learning process, they also have things like a kitchen or a radio studio for example. Both with De Verwondering and with Laterna Magica, teachers or coaches are involved in a larger part of the child's development. At SamSam, a teacher is involved in 1 year and at the other two schools teachers are involved for at least 2 years. This means that they have more overview of the whole process. At Laterna Magica the functional concentration is lowered a lot by the specialists who teach the children during their whole time in one unit.

At all schools it seems almost impossible to have employees deal with only one order type. This is probably due to the fact that the distinction between the three levels of secondary education can only be determined with certainty by going through the entire process of primary school.

4.5 Design

In this section the five design steps will be elaborated. The steps will be applied to the situation of SamSam.

4.5.1 Step 1 – Scope of the redesign

SamSam as primary school is the object of the redesign. Thereby ‘Wonderwijs’ is not part of the scope of the redesign. Wonderwijs is the board of 14 schools including SamSam. The board distributes the money they receive over their schools, and thus also provides money to SamSam. SamSam is autonomous in a sense that it can make its own decisions about their education and structure. Because SamSam is autonomous, they are also the one who could make some changes to the structure and therefore it is sufficient to choose the school as a whole as scope of the redesign.

4.5.2 Step 2 – Environment and mission, goals and strategy

Because it was not possible to do a participative project with SamSam the mission, goals and strategy of the school that are described below are drawn from the policy. The core of each subject is explained, detailed explanations can be found in the appendix.

4.5.2.1 Mission

The mission is about what the organization wants to be in the future. The mission of SamSam is to do justice to the individuality of the children. Every child is different and has to get the opportunity to show that. The mission of SamSam is to enhance the unique qualities and talents of each child. The core values that fit their mission can be found in Appendix 1.

4.5.2.2 Vision

The vision is the explanation of the mission by outlining future developments. Within the vision of SamSam their core values get appointed. SamSam calls itself a 'BOOMschool' (metaphor for a school with a tree structure). This means that there is a solid foundation with room for growth. In the first years of life, many children grow up in a protected environment. Over the years, their world is getting bigger and bigger. The school, together with the home environment, is an important foundation for the future of children. 'Samen maken we de school' (together we make the school), is a slogan that SamSam uses. The children who come to school, together with the parents, the team and the environment form the school as it is. The metaphorical roots of the tree symbolize the local bond. The sturdy trunk grows slowly but surely and is a stable base. This stands for the familiar 'leerstofjaarklassensysteem': a strong and safe learning environment, with a powerful, differentiated offering in the basic subjects. The branches of the tree grow in different directions. They represent the possibilities that SamSam offers children to develop. There is a lot of space to learn and discover. It is therefore not always about the result itself, but about the way to the result. The outlining of future developments can be found in Appendix 2.

4.5.2.3 Objectives and ambitions

SamSam has many objectives and ambitions, which are summed up below. For every objective the school has come up with a couple of questions which are used to guide them in achieving these objectives and ambitions. Those can be found in the ‘Schoolplan’ (SamSam, 2018, p.47).

- Meaningful learning
- Have a grip on the continuous learning lines
- Contemporary and meaningful assessment
- Culture
- Regulate behavior
- Meaningful meetings
- Collaborate and learn
- Define tasks and reduce workload
- Foster learning with IT
- 'Zorgprofilering'

- Difference in 'begaafdheid'
- Make school vision visible
- Involving outdoor space in education
- Follow and interpret learning outcomes

4.5.2.4 Strategy

The strategy addresses the question of how the objectives of the organization can be generalized and indicates the desired level of performance (Kuipers et al., 2012, p.290). For most of the topics covered, there is not necessarily a clear desired level of performance defined, therefore I would like to state that a policy (not necessarily a strategy) has been drawn up for the following issues: disciplines, IT, professional culture and personnel policy, task policy, training policy, career policy, student care, quality assurance, external relations and communication with the parents. An in-depth elaboration on these policies can be found in Appendix 3.

One interesting part of quality assurance to highlight is the use of research and innovation trajectory.

With the execution of its quality policy SamSam distinguishes between two processes that are closely related: (1) a research trajectory through which the school systematically explores educational issues and, if necessary, generates solutions that can improve education, and (2) an innovation project to systematically improve education at school. The innovation project can be divided into implementation and adjustment (SamSam, 2018, p.42-43).

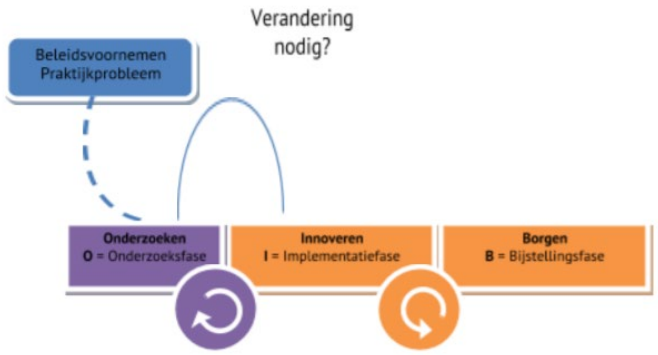

Figure 8 illustration of research and innovation trajectory (SamSam, 2018, p.42).

4.5.3 Step 3 – design specifications as starting points

The third step is to establish concrete design specifications as starting points for the redesign. The pursued primary process is the starting point for design. The primary process to be designed is determined by the scope of the redesign in step 1.

Structural construction is aimed at grouping and linking activities. From a design perspective it is therefore important to look at the process in three ways.

1. the primary process as order flow

2. the primary process as a pattern of interrelated activities needed to realize orders

3. the function requirements of the way in which the primary process is to be executed.

These points of view are discussed below.

4.5.3.1 Features of the order flow as a source of design specifications for the production structure at macro and meso level

The order flow is the in-, through-, and outflow of children. Based on the characteristics of the variability and unpredictability of the order flow, you can distinguish a typology of order flows. Order flows that come close to the characterization of the order flow of SamSam are:

- Turbulent flows
- Heterogeneous flows
- Semihomogeneous flows
  (Kuipers et al., 2012, p.293).

The order is, in the case of SamSam, the child. The order repertoire therefore basically consists of single pieces, but these can be scaled in a relatively homogeneous range of orders that can be 'produced' in periodic batches with, from batch to batch, a relatively fixed sequence of operations and not too large variations. You can speak of a semi-homogenous flow if the products differ from each other but nevertheless have more or less the same processing sequence (Kuipers et al., 2012, p.293). So all the children have to be educated on more or less the same topics, although some will have more challenging learning material than others. The learning of this matter happens sequentially. From educational level to educational level, so from batch to batch.

4.5.3.2 Characteristics of the pattern of interrelated activities as a source of design specifications for the production structure at meso and micro level.

A distinction can be made between preparatory, operational and support processes within the organization. A short outline of these processes:

- Preparatory processes:
  Preparing the lessons per subject, make things for the lessons, preparing supportive education, preparing lessons for highly gifted children.
- Operational processes:
  Teaching lessons by subject, handing out independent work, analyze results of test and the independent work of the children, determining which child belongs to which educational lever

per subject, taking tests, host parent meetings, providing extra care for children who are in need for this (e.g. children with dyslexia).

- Supporting processes:
  HR support (coaching and supervision of starting teachers and supervising trainees, performance interviews), teaching and supervision of highly gifted children, extra language support for children from another country, building maintenance, google learning environment apps for education, audiovisual material management, outdoor storage management, making timetables, children administration, PR, intranet page that informs the team and can inform each other about current affairs, contact external relations/agencies, 'EHBO', annual update of evacuation plan.

An explanation of why processes are subdivided in this way can be found in the Appendix 4.

The primary process of a teacher is about teaching. They teach in all subject areas. For each subject they have drawn up a group plan in which the needs of the children are written down. In the group plan is noted which child needs which type of care (shortened, basic or extended instruction). Depending on the type of care the students need, the instruction is given. Children with a shortened instruction are given extra work during individual work. The primary process of the teacher as it is now can be seen in figure 9.

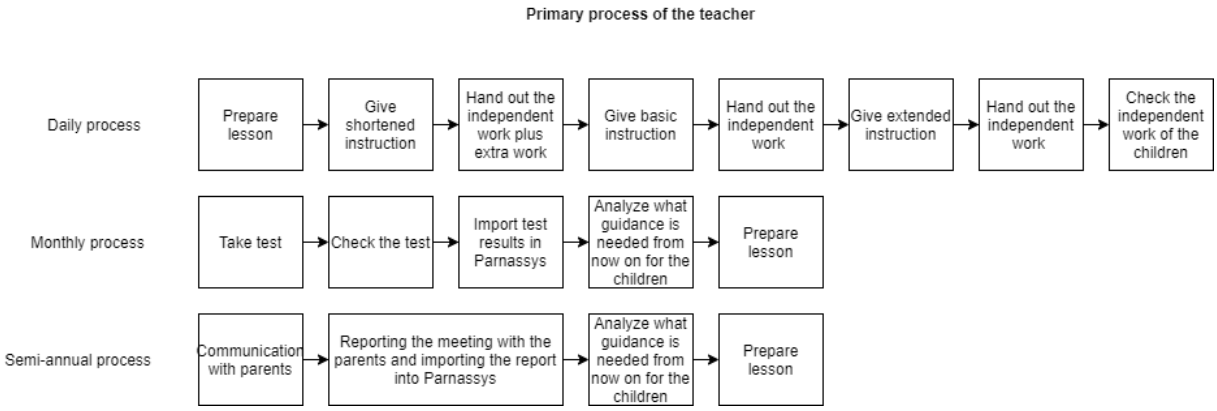

Figure 9 - overview of the primary processes of the teacher within SamSam

Preparing the lessons

Preparing the lesson is an activity done per teacher per group while there are multiple parallel groups (e.g. multiple groups 5). So the question is whether lesson preparation cannot be merged per subject. You could also think about merging the preparing of the three types of the instruction (shortened, basic and extended), as this requires different lesson preparation.

Checking of independent work and tests

The checking of the independent work and the tests is now done after school hours, because during school hours there is no time for checking the work. Checking and entering the results into Parnassys (system for administration and tracking of the children) could be outsourced (not be done by the teacher himself/herself). When outsourcing these activities it leaves more time for the preparation of the lessons and analyzing the results. Tests are bound to the methods used per subject. The tests provided by the methods also include an answer model. This means that checking can be well outsourced.

All the preparatory, implementing and supporting human activities required in their interrelationship as a result of the process design can be found in Appendix 5.

4.5.3.3 Characteristics of the functional requirements of the primary process as the source of design specifications for the control structure (Kuipers et al., 2012, p.296).

Functional requirements are requirements in terms of manageability, flexibility, capacity for innovation and quality of work, with which the organization must be able to comply when processing orders (Kuipers et al., 2012, p.296). The operationalization of the functional requirements to the case of Sam-Sam can be seen in table 2

Table 2 - Overview of the internal and external functional requirements of the organizational variables

	External functional requirements	Internal functional requirements	Operationalized to SamSam
Quality of work	Low level of absenteeism	Controllable stress conditions	the teacher focuses only on the core tasks of his job. All other tasks disappear because they are far removed from the core task or are outsourced to external parties, parents, class assistants or other teachers who have ambulant hours for this purpose. Wherever possible, tasks are automated (e.g. checking or taking care of instructions, ordering groceries) (SamSam, 2018, p.15 & 51).
	Low level of personnel turnover	Opportunities to (1) be involved, (2) learn, and (3) develop	time is deliberately planned for preparation and professionalization, possibly in fixed blocks (SamSam, 2018, p.15). Discuss points for a meeting are not only brought in by management but also by teachers. This promotes interactive and active involvement (SamSam, 2018, p.50). Involvement also happens through the research and innovation trajectories (SamSam, 2018, p.42).
Quality of organization	Order flexibility	Short production-cycle time	Production time is more or less a given time period of 8 years.
		Sufficient product variations	Children must achieve a minimum level in each subject area, but must also be able to take on more challenges in subjects for which they are more talented, for example, it must be possible to offer a different product variation per individual (limited to the capacity of the school).
	Control over order realization	Variable mix of products Reliable production and production time	Children must be taught several disciplines, but must also be given room to develop in a socio-emotional way. Non-methodical tests take place twice a year (CITO). In addition to Parnassys, the results in the workbooks, lesson instructions and the method-related tests are also used to determine whether a child needs extra care. All these tests and observations give the teacher an indication whether a child needs extra support or an additional challenge. Every six months the class is discussed with the IB-er during a group meeting (SamSam, 2018, p.40).
		Effective control of quality	Tests that are tailor-made and adapt to the child's level. Tests are carried out at many different times during the school year (for example, in the form of a progress test or as part of the testing of teaching methods) and not just at two points in time (as at the current situation). Testing takes place digitally and tests are analyzed automatically. Other learning areas are also tested (reflection, creativity, work attitude), for example on the basis of observation lists, children's own learning objectives or portfolios). (SamSam, 2018, p.16)
	Potential for innovation	Short innovation time	meetings are often held but have a short duration. Meetings are only held on the basis of a meeting necessity; anyone can take the initiative. There are usually only one or two topics on the agenda. You only participate in meetings if you have an interest in doing so. The need for many meetings disappears, because there is much more intensive communication with each other, with modern means of communication. Wherever possible, decision-making takes place online. For example, online polls and/or forums are used (SamSam, 2018, p.16).
		Strategic product development	Workgroups are set up at times of problems that can be solved in this way by means of an innovation project or a research project.

4.5.4 Step 4 – Structure design

Now that the design specifications have been determined, the design can be started. The ambition is to design a 'luchtkasteel' (i.e. ideal) design. Mostly in such a luchtkasteel design, one design will be sufficient. However I have to deal with part-time employees as a precondition, so it would make little sense to design a luchtkasteel that does not take that condition into account. Because I cannot fully meet the requirements of a luchtkasteel design I will elaborate on my choice of two macro segments instead of three and I will give a design option in case the number of children at SamSam grows. This design option will be mainly on the meso-level of the production structure. With this I try to make my argumentation for this design more complete.

Before the control structure can be designed, it must first be clear what can be controlled, that is why in the next paragraph I will use the rule to first design the production structure and then the control structure (Kuipers et al., 2012, p.298).

4.5.4.1. The design of the production structure

In order to create as few interfaces as possible between units, the grouping and linking of the activities of the primary process, at the unit and segment level, must be done in a way that de division of work is as small as possible. Therefore, the production structure must be arranged from macro, via meso to micro. (Kuipers et al., 2012, p. 299).

Macro-level production structure

Two segments fit best with 'what is familiar' and thus with SamSam's vision. In De Verwondering and Laterna Magica they have three segments, but in Laterna Magica the population is different, there are children from 0-12 years old. SamSam has children between 3/4 - 12 years, for this age group (3-12) Laterna Magica also has two segments. De Verwondering has divided the primary process into three segments that are not proportional, by choosing two proportional segments you keep more overview of the process.

In addition, despite the fact that teachers are trained to be able to stand in front of each group, there is often a preference for certain age group of children. Therefore, SamSam is divided into two segments. The first segment is for children from 3 to 8 years old and the second segment is for children from 8 to 12 years old.

Some subjects are now taught in the 'onderbouw' and not in the 'bovenbouw' and vice versa. These are educational choices that I won't touch too much with the redesign of the structure. Also for this reason it is logical to make two segments.

Because there are two similar segments, in which the activities match, I will elaborate on one. The segments differ in terms of the range of subjects, but the division of tasks will be the same in essence.

Because of the similarity I only work out one segment in detail to show how that will ultimately work out for a team. I do this to reduce the amount of design work and to keep it appropriate within the time and scope limit of this thesis.

At the end of their primary schooling, children must have at least achieved the level of group 6 in order to be able to move on to secondary education. This means, with the use of '1-zorgroute', that they have to master the basic explanation of group 6 in all subjects. In order to classify children per subject area more at the same level instead of at their age, certain levels can be combined. This results in six levels of education instead of four groups per segment.

The reasoning for merging the three different types of instructions that stem from the '1-zorgroute' is that it is assumed that the basic instruction of group 5 is equal to the extended instruction of group 6, and that the shortened instruction of group 6 is equal to the basic instruction of group 7 in terms of educational level. This is an idea that has already been discussed and seen as plausible (IB'er SamSam, personal communication, July 7, 2020).

This would look like this:

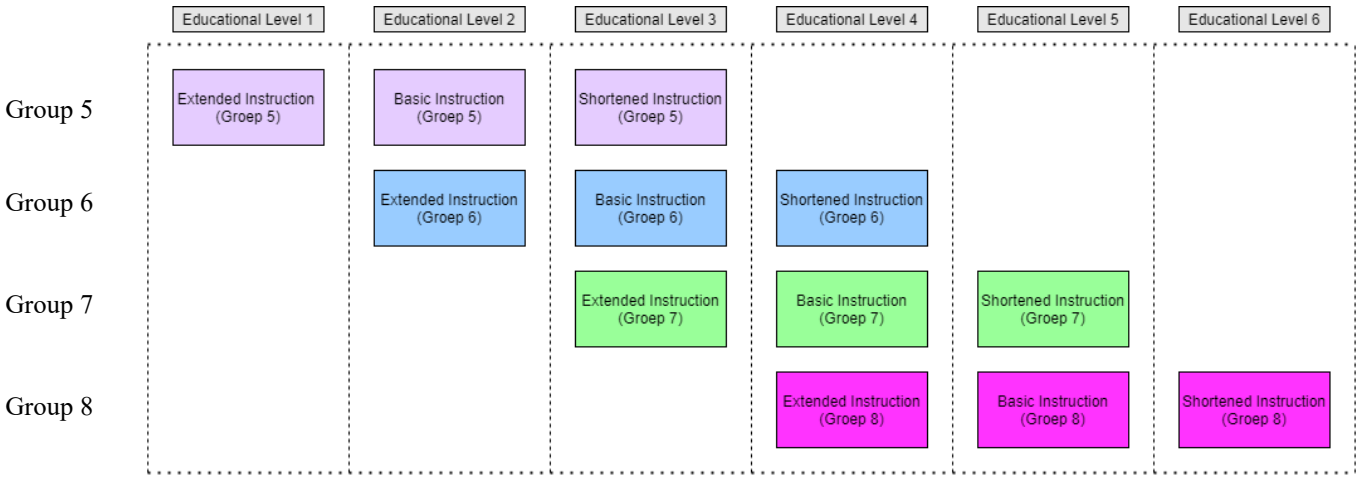

Figure 10 – new division of educational levels for the 'bovenbouw'

In the current groups, 25% of the children follows the extended instruction, 62,5% the basic instruction and 12,5% the shortened instruction. This means that the classes will not exceed the current set 100%. However, in the current structure SamSam has a few parallel groups and thus more children within that age group. Every child will have a mentor, this will be assigned on the basis of their educational level on Dutch and SED, because the teacher that they will have for that subject will also be their mentor. In proportion to the number of children there will be a teacher attached to them. Figure 10 does not represent actual groups, but a division of groups. It is possible, depending on how many children there are within a certain age group, to have parallel groups. The aim is not to exceed a maximum of 30 children within one group. So for instance, the first educational level will only have

one group and thus one teacher, whereas educational level three and four will have two or three parallel groups and thus teachers, dependent on how many children are within that educational level. This means that for each educational level there is one class, and in some cases there are parallel classes within the educational level. The mentor's task is to monitor the mentor child in terms of social emotional development, language skills and the subjects the child follows. Because of the content of the subject as well as the number of lessons in this subject, it is a logical choice to let the Dutch/SED teacher be the mentor of the child.

Meso-level production structure

The segmentation made within the macro-level creates a team, a ‘bovenbouw’-team. Because the segmentation in the macro level immediately creates a team there is not really a meso-level to design. In Appendix 6 I make recommendations for the meso-level when the school will grow. For now I continue with the micro-level design of the production structure.

Micro-level production structure

In order to reduce functional concentration, not every teacher is responsible for all subjects anymore. So instead of the usual groups (5,6,7 and 8 in the 'bovenbouw') there will be a division made on the basis of the subject area. Based on the content of the subjects they are merged into a subgroup (see Appendix 7). The whole ‘bovenbouw’-team teaches Dutch and SED, and in addition the teachers are divided into the different subgroups.

Subjects	**# team members related**
Dutch Language	All 15 members (12 teachers, 2 teaching Assistants, 1 administrative assistant)
SED (Social Emotional Development)	All 15 members (12 teachers, 2 teaching Assistants, 1 administrative assistant)
Creative	8 members (6 teachers, 1 teaching assistant, 1 administrative assistant)
World Orientation (WO)	8 members (6 teachers, 1 teaching assistant, 1 administrative assistant)
Arithmetic	8 members (6 teachers, 1 teaching assistant, 1 administrative assistant)
LO (Gymnastics)	8 members (6 teachers, 1 teaching assistant, 1 administrative assistant)
English	6 members (4 teachers, 1 teaching assistant, 1 administrative assistant)

Table 3 - division of subjects

The subgroups are different on the basis of the subjects that are given of course, but also on the basis of time to spend on education per week. In SamSam there are 12 teachers who are working within the 'bovenbouw', two teaching assistants and one administrative assistant. With those teachers, teaching assistants and administrative assistant the subgroups are classified as can be seen in table 3.

The ‘bovenbouw’-team thus consists out of 15 members. The ideal group size is between 8-12, but there is a margin with a lower limit of 4 and an upper limit of 20 (van Amelsvoort, 1992, p.98). A team of 15 members does not meet the ideal criteria for a group size but still is within the margin. A team of 15 members still can be seen as acceptable because there are a lot of part-time workers within

primary school education and also within SamSam. With the size of the team they are already close to the limit. As the school grows, the team cannot rise above twenty. That is why I will also make recommendations for when the school will grow, this will mainly relate to the meso-level of the production structure.

By splitting the subjects in six different educational levels a child can differentiate over the different subjects. A child can be in level three of Dutch Language and level 4 on Creative for example. This also suits the vision of SamSam of being a 'BOOMschool', which means that there is a steady strunk but the branches of the three grow in different directions. Also it fits with their statement of 'Samen maken we de school', therefore it is important that a child is not just a student of one particular teacher but is a student of the school. By handling this new design they are students of multiple teachers.

Because of the large impact that the subject Dutch Language has in terms of hours of education in a week, all twelve teachers of the segment will teach this subject. Also, because of the large impact in time, this will be counted for as the mentor group of the children. Dutch Language is divided into the six different educational levels as seen at the macro-level of the production structure. Each educational level is one group, and therefore this is directly the mentor group of the children. This in turn corresponds to the vision of SamSam to have a secure and steady base for the children. It can be assumed that there are more children within educational level three and four than in educational level one or six. In proportion to the number of children within an educational level of a subject, a number of teachers of the subgroup will be assigned to an educational level.

SED is connected with Dutch Language because of the mentoring role that the teachers have there. Because they are the mentor of the children they should also keep track of the social-emotional development of the children.

The rest of the subgroups are grouped together on the basis of how many hours in the week the subjects occupy, please see Appendix 8 for the exact numbers. Therefore Arithmetic and LO are grouped together, and WO and Creative are grouped together. Also English is grouped with WO and Creative but that team can be smaller because English is not taught on every educational level.

Below you can see the deployment matrix. Teacher 1 and 2 have a double role within the organization (they are also member of the staff group), and therefore do not also teach English.

Table 4 - deployment matrix

	Dutch	SED	Creative	WO	Arithmetic	LO	English
Teacher 1	x	x	x	x			
Teacher 2	x	x	x	x			
Teacher 3	x	x	x	x			x
Teacher 4	x	x	x	x			x
Teacher 5	x	x	x	x			x
Teacher 6	x	x	x	x			x
Teacher 7	x	x			x	x	
Teacher 8	x	x			x	x	
Teacher 9	x	x			x	x	
Teacher 10	x	x			x	x	
Teacher 11	x	x			x	x	
Teacher 12	x	x			x	x	

In the current situation English would only be given from group 7. Looking back at figure 10, this means that in the new structure English is only taught from the third educational level. I choose to let English start in the fourth educational level instead of the third educational level because that is the level that equals instruction for group 7. Depending on the learning ability of the children at school it will be possible to teach from the third educational level, since in the old structure some of these children also were taught English.

Because it concerns only three educational levels, this is a smaller team. Please see Appendix 8 for a detailed distribution of teachers by subgroup. All subgroups are supported by the administrative assistant and at least one teaching assistant. In total there are two teaching assistant per segment. Both teaching assistants assist the subject Dutch Language. Further they are divided over the subgroups. An overview of the specific supporting tasks for the production structure can be found in Appendix 9.

The subgroup has the say in which method should be used for the different subjects. Workgroups that previously arose from a team meeting about the lack of a method can now be done by themselves. In this way they keep the quality of their subgroup up-to-date.

In the case of transcending educational activities, project groups are set up for the duration of the project. These are about topics that are transcending educational activities such as *schoolreisje, schoolboekenweek,* etc. Those project groups are thus not necessary linked to the subject departments.

The primary process of a teacher used to look like this:

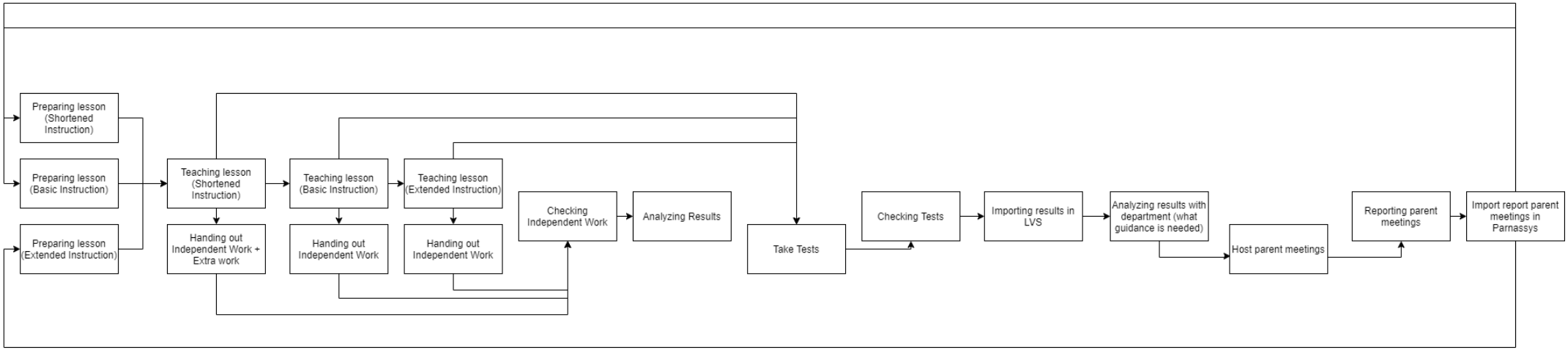

Figure 11 - old primary process of SamSam

By merging the subjects and distributing the different levels among the teachers, plus shifting tasks such as: checking independent work and tests, import results in the system, to the teaching assistants, the primary process of the teacher looks like this:

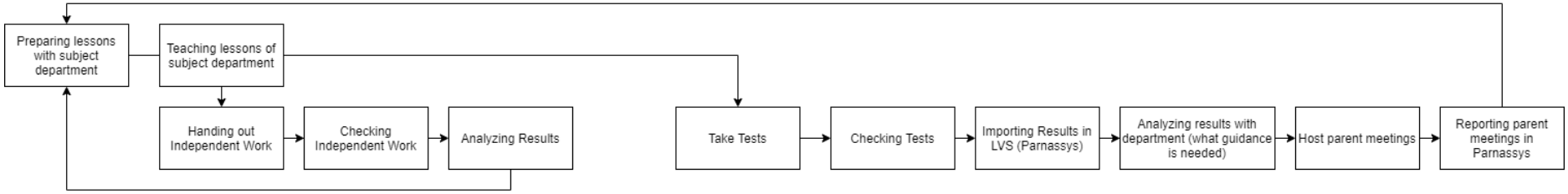

Figure 12 – new primary process of SamSam

The order is the child, the product is a child who will follow vmbo, havo or vwo in secondary education, so therefore the secondary schools are the buyers/customers of primary school SamSam. Which level of secondary education the children will follow depends on how far they have come in terms of level per subject. So to go to 'vmbo' the children should have a minimum of the basic instruction of group 6, so level three in the new design, for all subjects. Per subject department there is one team that is responsible for the whole process of development of the children.

4.5.4.2. The design of the control structure

Every interface that is created within the production structure requires coordination. When it is possible to design a production structure with relatively independent units, the burden for the control structure then has already been drastically reduced by input simplification and reduction of the number of interfaces in the operational process itself (Kuipers et al., 2012, p.300-301). The control structure is set up from micro to macro, the necessary regulatory capacity at team level is first looked at, followed with the management and then the overall organization.

Micro-level control structure

Employees are linked to multiple subgroups. Per subgroup the following managerial responsibilities will be added:

- Ensuring the right conditions for the subjects: right method, right form of testing (these come about via research and innovation trajectories)
- Keeping their own budget (with the given budget from the central organization)
- Supervision of interns
- Facility management of their team

Meso-level control structure

Is about the alignment of task forces that depend on each other. Within primary school education, the real dependence between segments is not as great as you might expect in a typical production process of, for example, an airplane. Where the fuselage must be built before the interior can be placed. But in the end it is all about the overall picture of a child that you can ‘deliver’ to a secondary school. The children are judged as a whole and not on all subjects apart. That is why mutual coordination between the teams is still important. The mutual coordination is also important for the social emotional development of the child. This is something that has to be measured across all lessons, but in which the mentor has the coordinating role.

In order to ensure good coordination, there is a staff group, consisting of someone who is a staff member in the field of education and facilities (BC), and someone who is a staff member in the field of care and support (IB'er). However, the control activities will remain with the subgroups as much as

possible. Both staff members will be managed by the subgroups on the basis of requests from them. The function of the staff members then consists of bundling these requests and looking at whether there is a need for this in other segments so that tasks can be bundled as efficiently/economically as possible. It is also up to the staff group to provide and execute requests for certain facilities (e.g. purchase of new method) or provide extra care (e.g. extremely gifted children who do not fit within the standard levels). This is because the independent subgroups have the best insight into exactly what they need in order to be able to do their work. Facility management, supervision of trainees, which method is used per subject is in principle all in the hands of the subgroups and therefore the regulation by design is mostly in their hands.

The transition between the two macro-segments needs coordination too. Therefore the IB'er of the 'onderbouw' and the IB'er of the 'bovenbouw' will support the subgroups. The teachers of the 'onderbouw' will come up with their results of where a child should be placed (on which educational level per subject department). The transmission of this information will mainly take place through the IB'ers. To make sure the transition between the 'onderbouw' and 'bovenbouw' segment goes well the IB'ers thus have a supporting role in this.

Macro-level control structure.

In addition to the micro and meso level, there is also a need for control activities at macro level. To this end, it is important to keep an eye on the future independently of daily activities. The strategy formation and the coordination between the macro segments is still necessary in order to maintain the track of the entire organization. The headmaster ensures that the strategy is formed (i.e. strategic regulation) and fits with the day-to-day implementation. A lot of plans will emerge from the subgroups that indicate what they need etc., but an overarching consultation with all subgroups, staff and headmaster will be necessary to keep an overview of the entire development of the organization. Subgroups transcending problems are dealt with by the headmaster. The subgroups can contact the headmaster for these types of issues when they arise. HR is also in the hands of the headmaster. For example, if a replacement for a teacher is needed for a day, the information will come in the first instance from the subgruop, but its implementation/regulation is in the hands of the headmaster (operational regulation). The headmaster also keeps an eye on the separate project groups, this is part of the organization's strategy, but does not fall directly under the responsibility of the subgroups because they are mainly concerned with education-related issues. These are loose issues that occur a few times a year for a shorter period of time (schoolboekenweek), coordination of loose project groups and the instigation of these is done by the headmaster. The headmaster will together with the IB-er and the bouwcoördinator make up the budget for the whole school, and will divide budgets over the subgroups. Scheduling the timetables can be done now for the whole 'bovenbouw' at once and is done by the staffmemberteam.

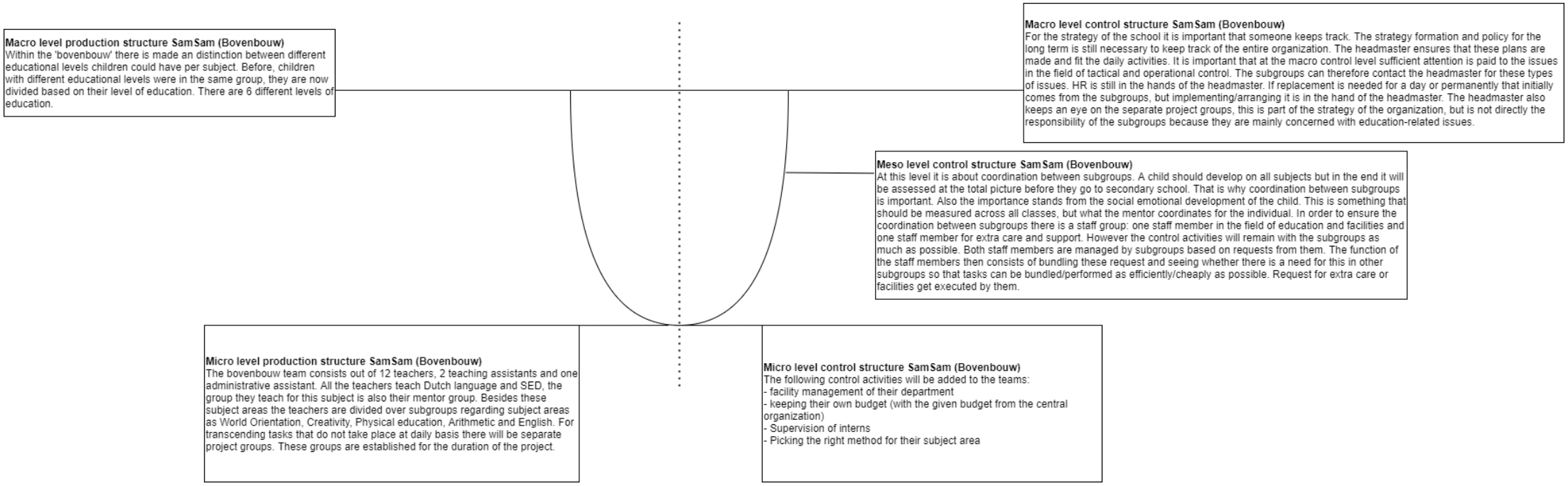

Figure 13 - summary of the design of one of the segments (bovenbouw)(U-shape)

4.5.5 Step 5 – the (technical) systems

As mentioned in chapter 3 I chose to only look at the building and not at the other (technical) systems within the organization because within this context of a primary school the (technical) systems do not require strict design specifications.

For the 'bovenbouw' there were seven groups in the year 2019-2020. In the new design there are six different levels, which means that there will be (at least) six mentor groups. For each mentor group there will be a classroom. In the concept layout of the bovenbouw I used as example six groups as starting point.

This means that for each mentor group there will also be a certain room/classroom. This is then the fixed place of the mentor group. Because per subject department the lessons are given in parallel, it is possible to use these rooms for the lessons of the other departments for the different six levels. For LO a separate gymnastic room is needed.

SamSam has already talked about the building in their future plans. For this purpose she wanted spacious classrooms for both teachers and students. Many consultation workplaces, quiet rooms, corners, theatre room, craft room, etc. (SamSam, 2018, p.14). The building has to be flexible. Many teachers think it is important that it is also possible to learn explicitly outside (school gardens, outdoor places, classroom with its own outdoor space) and that the greenery enters the school more often (SamSam, 2018, p.14).

It can be argued that the children first receive instruction and then start to work independently. This is how it is arranged now. That would mean that the six classrooms are for Dutch Language and mentor lessons (SED), these classrooms are therefore equipped for the Dutch Language profession. For LO there will be a separate gymnastics room. This means that the departments: Creative, WO, Arithmetic and English remain. English can be taught in the classrooms of the mentor groups, because this is already equipped for teaching a language. For WO it is conceivable that there will be outdoor areas in which they can carry out their own assignments (e.g. for nature/geography). For Creative it would be logical to divide a large craft room (drawing, handicrafts), a music room and a theatre room in the auditorium for drama.

- 6 classrooms (Dutch Language, Mentor lessons (SEO), English, Arithmetic, History)
- Gymnasium (LO)
- Outdoor classrooms (Nature, Geography)
- Crafts room/Atelier (Drawing, Handicrafts)

- Music room (Music)
- Theatre (Drama) (in the auditorium, to be used for multiple purposes)
- IT Landscape for independent and quiet working
- Space for independent quiet work (without PC’s)
- Space for group work

In addition, there must be space for the subgroups to meet. Ideally, the subgroups to which the same teachers are related will get its own space. Here they can leave their own stuff and do their own independent work. The following would apply:

- Large meeting room for Dutch Language and SED (minimum 15 people)
- Space for subgroups Arithmetic and LO (minimum 8 people)
- Space for subgroups WO, Creative and English (minimum 8 people)
- Space where teaching assistant can check independent work and test, and enter results
- Room where IB'er, BC, and headmaster can be. With a place for meetings. In this way, the room is accessible to the subgroups. This space is located next to the rooms for the subgroups, so you can coordinate quickly.
- Room where extra care can be given (personal guidance)

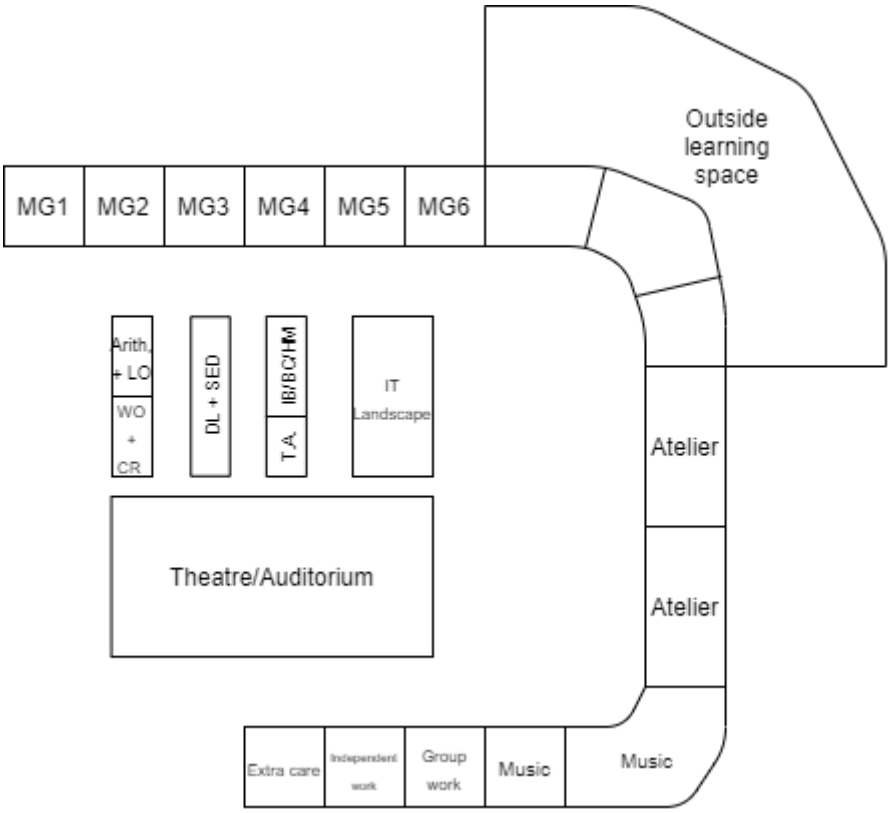

Figure 14 –concept layout of the 'bovenbouw' in the new school building

4.6 Comparison old and new design based on the seven parameters of De Sitter

4.6.1 Functional concentration

The value of functional concentration is lower within the new design for SamSam. Before teachers had to give each subject to every order type, delimited for one 'leerstofjaar'. Now they do not give each subject, but the subjects they teach have been reduced to a few subject areas. They teach the whole subject over the whole 4 years, instead of only a part of the subject for one year. They follow each order type, but the functional concentration is reduced by not having the operational tasks of teaching every subject.

4.6.2 Operational differentiation

Preparing and making is integrated within the job of the subgroups. They prepare their lessons together, and teach individually the different educational levels. They analyze together the results of the children and decide what should be done for the children as next step, which is also a form of preparing. The semi-annual meetings with the parents and the reporting of the meetings with the parents is also done by the subgroups. The subgroups consist out of teachers, teaching assistants and an administrative assistant. The teaching assistants perform the supporting activities such as correcting the independent work and the tests of the children, they do a short analysis of type of mistakes that are

made so that the rest of the subgroup can analyze the overall picture and can include this information in the preparation of the lessons again. The team always discusses the results of tests and parent interviews together to draw up a new plan where necessary, and also provides important information back to the child's mentor.

Some of the supporting activities are not included within the subgroups. Within the subgroup they analyze which type of care is needed for children or what kind of facilities they need. If the conclusion is that some of the children need extra care that they can't take care of within their educational levels of the subject they will went to the IB-er. The IB-er coordinates and guides children that require extra care.

4.6.3 Operational specialization

The degree of operational specialization within the new design is lower than in the current design. The teachers are no longer specialized in just the level of education of one group, but now on the whole subject matter for the 'bovenbouw'. Before the teacher coupled to one group was specialized in the learning material assigned to that specific group. Now the teacher is no longer specialized in the level of the group that he or she is teaching. Now the teacher is specialized in a wider range of learning material. They teach within different subgroups and are specialized in the learning material of the whole 'bovenbouw'. Therefore the operational specialization is lower than before.

4.6.4 Separation

There is not a large separation between the production structure and the control structure within SamSam. The teacher is part of multiple subgroups which are mainly autonomous. Within their subgroups they have several control activities that they are responsible for. Therefore they are very flexible and can make decisions fast. The control structure is mainly supporting for the production structure. For the overall strategy of the school and the coordination between the macro segments the headmaster is still in charge to monitor and coordinate the strategy and coordination between segments, because that is transcending the educational activities within the organization.

4.6.5 Differentiation of regulatory activities into parts

The degree of differentiation of regulatory activities into parts has a low value within the new design of SamSam. Monitoring refers to gathering information with respect to indicators which define what should be monitored, within SamSam the teachers monitors the children within the group they are responsible for. The teacher monitors the educational activities of the children. Assessing includes a comparison of the indicator values with norm values and a judgement with respect to their difference, this is done by the subgroup. Coming up with a follow up plan with what to do with the results of the children is done by the subgroup. It can be that they decide that a child should switch from educational

level or that it requires extra care. When a child requires extra care they go to the IB'er. Therefore all these regulatory activities mentioned are in the hands of the subject departments and thus the teachers.

4.6.6 Differentiation of regulatory activities into aspects

The operational regulation is mostly done by the subgroups. They are able to do this because they are so autonomous. A part of the operational regulations is done by the headmaster, this contains activities that are school-wide and most of the time transcend education. Strategic regulation is partly done by the subgroups but in consultation with the headmaster and the staff members (IB-er BC). The headmaster coordinates this strategic regulation. Regulation by design is partly done by the headmaster, the input for who is part of the organization comes from the subgroups but the execution of HR is done by the headmaster. What should be integrated in terms of IT and choosing a new method for a particular subject/course is done by the subgroup. Therefore this value may be more or less the same as in the previous design. Difference is that the regulatory activities are mostly conducted by the subgroups now, but some of the coordination is done by the headmaster.

4.6.7 Specialization of regulatory activities

Specialization of regulatory activities has a low value, the activities are mostly appointed to subgroups. The subgroup takes care of mostly all regulatory activities, so there are no specializations there. The specialization of regulatory activities that can be found is with the headmaster, she coordinates some of the regulatory activities which thus can be seen as specialization.

For the overview you can see the difference between the old (left) and new (right) design in figure 15.

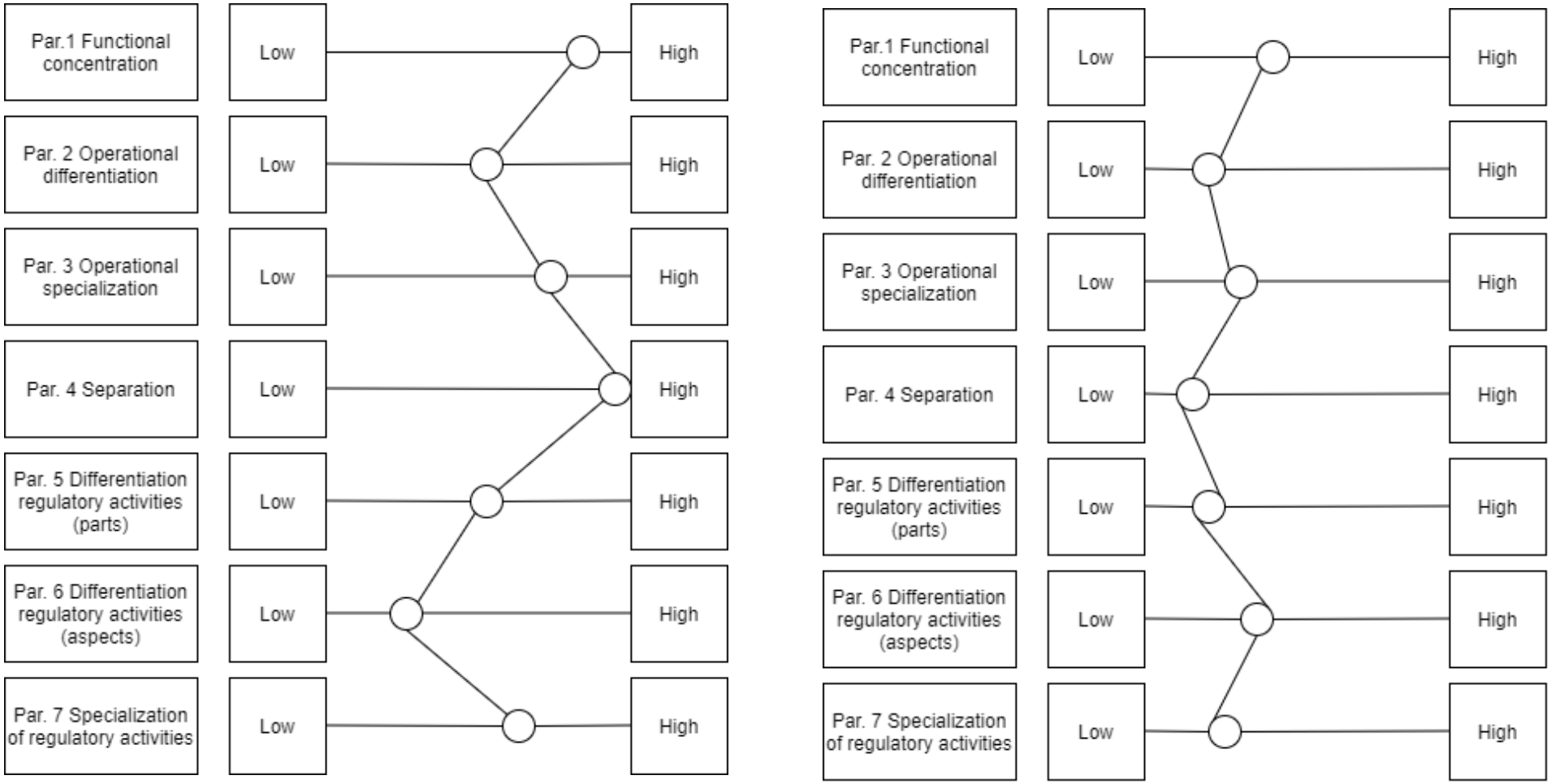

Figure 15 - overview of the old and new parameter values of SamSam

5. Conclusion, Discussion and Recommendations

5.1 Conclusion

Within the conclusion I will give an answer to the research question of this thesis:

How can the structure of a primary school like SamSam be redesigned in such a way that quality of work and organization will improve and reduce the current high work related stress?

The new design of SamSam consists out of a new division of educational levels within the bovenbouw of the primary school. There are now six educational levels that children can have in seven different subject areas. The seven different subject areas are divided over the subgroups of teachers of the bovenbouw of SamSam. Per subgroup there is one team, whom are responsible for the preparing, making and supporting tasks as well as a lot of regulatory tasks. Therefore those subgroups are mostly self-managing. This leads to the following outcomes on quality of work and organization.

The quality of organization has increased within the new design for SamSam.

- The order flexibility has increased because of the product variations and the variable mix of products that come into play within the new design. The children are able to have a different educational level on different subjects. Therefore there is a variable mix of products but also a sufficient product variations because the differentiation of the children over the educational levels of subject areas will differ for most of the children. In this way you can respond more easily to different needs.
- Control over order realization has increased. Per subject department the teachers can indicate whether the children are on schedule or not, and can also decide that a different kind of care is necessary for this child. Therefore there is always an eye on the production time and is therefore reliable. Also the quality control is more effective because teachers are specialized in the different subject areas and together with the subgroup prepare the lessons, give the lessons and thus decide which method suits the overall learning line the best. With the method also comes the type of test, which are more in line with the overall goal.
- Potential for innovation has increased also, this is because most of the regulatory activities are put within the subject departments themselves. This means that they can shift faster when change is needed. Also strategic product development has increased because within the subgroups they perform research and innovation trajectories.

The quality of work has also increased with the new design.

- There are manageable stress conditions because the teachers got more regulatory potential in their own tasks, so they are able to solve their own problems instead of being dependent on others. The range of tasks has become less extensive and a teacher focuses only on the core tasks of his job. All other tasks disappear because they are far removed from the core task or are outsourced to external parties, parents, class assistants or other teachers who have ambulant hours for this purpose. Wherever possible, tasks are automated (e.g. checking or taking care of instructions, ordering groceries) (SamSam, 2018, p.15 & 51).
- There are also more opportunities to be involved, learn and develop. Because of the subgroups and the regulatory activities assigned to those groups, they are able to learn together and develop together. This is partly reflected within the working groups where they perform research and innovation trajectories.

With the new design made for the structure of SamSam the quality of work and organization improved and therefore the implementation and/or execution of this design should lead to les work related stress within SamSam.

5.2 Discussion

Within this section I will discuss the interpretation of the results, the contribution to existing knowledge and the critical reflection on the limitations of the research.

What is interesting about the results of this research is that primary schools which also make use of the 'leerstofjaarklassensysteem' and a MT consisting out of IB'ers, OC, BC and a headmaster can probably reduce the high work related stress by implementing the proposed type of design. Surely, this design is based on the vision, mission and strategy of SamSam but the broad outlines will mainly be the same. Because of the lack of the participative method, it has remained a somewhat general ideal design, inspired by the core values of SamSam. This is also a limitation of the research, which I will elaborate on in the limitations section.

The diagnosis and new design of SamSam provide a clear overview of the school's primary process and the related support and preparation activities. In this way, this thesis can also contribute to the program of requirements that the school must submit for the new building.

This research has offered a practical contribution by showing the applicability of the integrated redesign chain on primary schools in combination with a design research. It showed that a successful diagnosis and design can be made for an organization such as a primary school using the integrated redesign. The operationalization of the functional requirements for the primary school and the analysis of the primary process of a primary school can be used in further structure-related research of primary schools.

5.2.1 Limitations

Because of the impossibility to do a participative research (due to Covid-19) there is a possibility that the new design is not going to be accepted by the employees of SamSam. They have not been a part of making a new design and can therefore feel like the new design is imposed on them. This, in turn, may prevent the new design from being implemented successfully. For example, the 'leerstofjaarklassen-systeem' was mentioned as part of their vision. This is not implemented in the new design. I did include the message that was attached to it: 'a trusted basis'. But this is my interpretation and that may not be supported by the employees. So not being able to carry out a participatory method was a limitation for this research. In the case of a participatory process, such matters would no longer have been a matter of doubt.

Another limitation of this research is related to the result of the design. The new design implies that some of the teachers will not teach some subjects anymore, and it sets some subjects together without knowing if that is the preference of the teachers also. It is therefore possible that this format does not fit well with the teachers of SamSam. However, it is possible to deviate from this, as it is now based on minimum part-time hours, while some teachers will work more than this.

5.3 Recommendations

In this section I will discuss the practical implications and the directions for further research in this section. First I will elaborate on the practical recommendations for SamSam, followed by recommendations for further research.

5.3.1. Practical recommendations for SamSam

The transformation from the current structure to the new structure is difficult to do all at once. Cohesive and manageable parts of the new design must be implemented one by one. Those parts have to be identified and then a logical order must be chosen before starting the implementation.
For SamSam it is a recommendation to select the subject areas as portions. Starting with the subgroups WO, Creative, English, Arithmetic and LO. Dutch language and SED can start later because this will lead to a new classification of groups and that will be a major intervention straight away. In order to implement the new design step by step, it is more logical to start with the subgroups. The employees can be assigned to those subgroups and they can already prepare the lessons and analyze the results of the children together. If this pilot works, the subject area of Dutch language and SED can also be formed and implemented. One condition for the new design to work is the support of the building. It is therefore desirable to only really implement the final design after the move to the new building.

5.3.2. Recommendations for further research

During the research I came across the fact that the design of the primary process of a primary school is quite dependent on the primary process of secondary education that we have in the Netherlands. Because a primary school has to adhere to the three-fold output, it is slightly limited. It would be interesting for future research to look at the primary process of secondary schools. If the input of the secondary schools could deviate from the existing setup, the output of primary schools could also be different. This would allow the process of primary schools to be more flexible, making room for further improvements

Further research should be carried out to see whether the new organizational structure solves the problem of high work related stress. To this end, implementation and evaluation must be carried out. This is the only way in which one can really conclude that the integrated redesign chain in combination with design research can improve the school's problems. Further research can explore the entire process of the intervention cycle.

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Appendix 1

Mission of SamSam

The mission is about what the organization wants to be in the future. The mission of SamSam is to do justice to the individuality of the children. Every child is different and has to get the opportunity to show that. The mission of SamSam is to enhance the unique qualities and talents of each child. Core values that fit with their missions are:

- Solid foundation
- Innovation
- Safety
- Research
- Own responsibility
- Self-confidence
- Courage
- Cooperation

(SamSam, 2019, p.10-11)

SamSam is partly customer driven and partly supply driven. They make a tripartite division within their standard 'leerstofjaarklassensysteem', children can receive an: (1) extended, (2) basic or (3) shortened instruction. In this way they get more customization than one standard level of instruction, but customization for each individual child is not the starting point for SamSam. They are concerned with each individual though, and look at the unique qualities of each child and try to achieve this in a 50/50 customer-driven/supply-driven way (Kuipers et al., 2012, p.289).

Appendix 2

Vision of SamSam

Explanation of the mission by outlining the future developments in the field of customers, competitors, labor and technology and the image that important stakeholders (employees, shareholders, society, unions, etc.) have of the organization can be found in the appendix (Kuipers et al., 2012, p.289).

In the field of customers: *'The number of children on SamSam'* (Schoolplan, p.18).
Due to a lot of new construction in the vicinity of the school, they expect that the number of children will increase from 2020 onwards. Because there is an increasing influx of children from the city, the connection with the village decreases and there is more focus on the city. Even though the bonding with the village is decreasing, there is still a willingness to work together on a good, pleasant and safe school.

Competitors have a different educational concept than SamSam. Some children have switched to a competitor in the past because of the different educational concept, but you can also see the switch the other way around. Because SamSam is close to all new housing estates, more schools have been added over time. There is a school that is larger but has roughly the same educational concept, and three primary schools nearby that all have a different educational concept (SamSam, 2018, p.18).

Labor: two topics that are worth mentioning here: '*Reduction of regulatory burden'* (SamSam, 2018, p.20) and *'The professionalism of the teacher'* (SamSam, 2018, p.21).
High work pressure is partly due to regulatory pressure. In November 2017, the Ministry of Education, Culture and Science distributed the 'Ruimte in Regels' guide to primary schools. The purpose of this guide is to help teachers ease that pressure. The central message is that schools should only administer if this is useful. For example, group plans are not mandatory and restrictive and stimulating factors must only be established for students with an development perspective. SamSam must mirror its working method to the guidelines set by the inspectorate (SamSam, 2018, p.20-21).

Since 1 August 2017, the 'Wet Beroep Leraar' has been in force. This law establishes the professional space and authority of teachers. In the so-called 'Deelnemersvergadering (DV)', there are representatives of the professional group who have to give further substance to this law. The main powers of the delegates are to establish and change the professional standard; making a proposal for the periodic reassessment of the competence requirements; developing frameworks and principles for 'het professioneel statuut'; making a proposal for the re-registration criteria and the validation rules; determining and changing the internal working method. SamSam has its own representative in the 'DV'. This allows them to continue to follow developments closely and adjust their policy accordingly.

Technology: ‘voorsorteren op de maatschappij van morgen’ (SamSam, 2018, p.22).
Technology has changed the way we work and live together. These developments will continue even more strongly in the near future. Under the influence of technology, there is an increasing need in society for knowledge workers and ‘people’ workers, and a decreasing need for routine functions such as production work. In addition to language and arithmetic and the core subjects, the skills here are working together. Creativity, ICT, literacy, communication, problem solving, critical thinking and social and cultural skills are important as well. A committed, enterprising and curious attitude also comes in handy in the 21st century (SamSam, 2018, p.22).

Important stakeholders: small scale and the impression that their child is really ‘seen’, an important argument for choosing SamSam. SamSam has been a community school since September 2011. This means that the school cooperates with ‘buitenschoolseopvang’ and ‘peuterspeelzaal’. The aim of the collaboration is to ensure that the quality of education and pedagogical guidance increases further. Also there will be a new village center: feasibility study has been completed. There will be a multifunctional center ‘het Dorpshart’ around the Leonaruskerk. In the heart, various facilities must be brought together, such as a gym, ‘peuterspeelzaal’ and SamSam (SamSam, 2018, p.22).

Employees: some teachers will retire early. Both the average age of personnel and the proportion of employees aged 60-67 are expected to decrease. Where in the past there was a shortage on the labor market, there now seems to be a teacher shortage. For the time being, this is not the case on SamSam, but it is expected that this will happen in the future (SamSam, 2018, p.19).

Society: three topics are worth mentioning here *‘De overgang van PO naar VO/Eindtoets ‘* (SamSam, 2018, p.20), *‘Toenemende aandacht voor transparantie en verantwoording’* (SamSam, 2018, p.21) and *‘Sociaal-emotionele ontwikkeling’* (SamSam, 2018, p.20).

Since 2015, school advice regarding the level of education for the secondary school (vmbo/havo/vwo) has been leading in the placement of children in secondary education. The final test shows to what extent children master the reference levels for language and arithmetic. The final test also shows which type of further education suits a child. Based on the results of the final test, a school advice can only be adjusted upwards. Recently however, letting the final test play a central role in the choice of the school has been up for discussion. The idea here is that an independent test reduces social inequality (SamSam, 2018, p.20).

Social involvement seems to be increasing, partly as a result of modern means of communication and a high information density. Education is also critically followed from different sides: parents, politics, media, local residents. A primary school is also expected to strive for transparency in its policy, results and day-to-day affairs (SamSam, 2018, p.21).

> Teachers have the feeling that children are often raised using a positive approach, with children usually receiving many compliments. This is an obstacle for dealing with disappointments. Teachers sometimes signal that children lack essential basic skills that are important for their well-being and that of others, which causes that they do not develop further. This has consequences for the working attitude of children. In addition, it seems as if there is an increase in the number of behavioral problems within our regular education. This affects the child, but also the class as a whole, the teacher and in fact the whole school (SamSam, 2018, p.20).

Unions: '*werkdruk/salaris'* (SamSam, 2018, p.21).
With the establishment of the 'PO-in actie' union, the working conditions of primary school teachers have returned to the political agenda. After two national strike days in 2017, the readiness to participate in protests or other political actions among teachers is high. The main focus of these actions is a fair salary and an investment which is needed to reduce the workload. Many teachers and parents of SamSam support the action (SamSam, 2018, p.21).

Appendix 3

Strategy of SamSam

Disciplines

Objectives have been set for each discipline and different methods have been chosen to meet these objectives for each discipline (SamSam, 2018, p.27-33).

IT and media literacy

IT is a means to support students in their learning process. The task of the school is to prepare children for the society of the future. The school has chromebooks and uses software/exercise programs (SamSam, 2018, p.34-35).

Professional culture and personnel policy

The slogan of SamSam is: 'Together we form a school'. Good internal communication is essential in the pursuit of high-quality education. Currently they have the following meetings: a team meeting every three weeks, a 'bouwvergadering' once a month, and a weekly meeting for the headmaster and 'bouwcoördinatoren' (SamSam, 2018, p.35-36).

Task policy

The tasks are divided in order to follow the policy which is elaborated in the school plan. The ability, possibilities and personal circumstances of the employee to perform a particular task are taken into account with division of the tasks. Moreover, individual wishes are taken into account. SamSam strives for the widest possible job performance. In this respect, the teacher may vary from teaching to non-teaching duties during the school year and from year to year (SamSam, 2018, p.37).

Training policy

The school considers it important that teachers on SamSam keep developing. Professional competences must be maintained and enhanced. In the field of training, SamSam distinguishes between learning in the workplace (with and from each other), in-company trainings and '*nascholing'* (SamSam, 2018, p.37).

Career policy

This bulletpoint is threefolded: (1) performance reviews are held, (2) guidance and coaching of new staff and (3) policy aimed at improving working conditions (SamSam, 2018, p.37-38).

Student care

All children deserve attention and care, but certainly those who have difficulty learning or who are very good at learning. SamSam therefore strives to offer children tailor-made education. Timely identification of children who require extra attention or care is essential (SamSam, 2018, p.39).

Quality assurance

The basic principle in the quality assurance policy is that SamSam can justify its working methods and initiate, monitor and adjust new developments in a systematic manner. Policy intentions are signaled in the following manner:

- At least once every six months an analysis of the revenues with the team takes place;
- A brief inventory of the state of affairs per quality area takes place annually (annual plan);
- Every four years there is a brief inventory of the state of affairs per quality area (school plan);
- Finally, there may be incidental (unplanned) developments in the internal or external environment of the school, where the school is forced to do something.

With the execution of its quality policy SamSam distinguishes between two processes that are closely related: (1) a research trajectory through which the school systematically explores educational issues and, if necessary, generates solutions that can improve education, and (2) an innovation project to systematically improve education at school. The innovation project can be divided into implementation and adjustment (SamSam, 2018, p.42-43).

External relations

Contact with residents and organizations in Oosterhout is maintained. Children go on field trips, experts and sports clubs work in the school. External communication takes place via contact persons from the school (SamSam, 2018, p.44).

Communication with the parents

It is seen as important to have good contacts with parents. School and parents pursue the same goal: to ensure optimal development of the child. Parents are seen as equal discussion partners.

- Always involve parents in school activities;
- Regularly inform parents about the current state of affairs in the area of the child's development and well-being;
- Consult with parents at an early stage if a child maybe needs extra care (SamSam, 2018, p.45-46).

Appendix 4

Elaboration on division of processes into preparatory, operational and supporting processes.

Preparatory processes:

Preparatory processes are carried out in order to make the primary process feasible. The primary process is preparing children for secondary education and that is done by teaching. This means that preparing lessons per subject and making things for the lessons are preparatory processes, because they enable teaching. Within SamSam there are also children who need extra care, the IB'er within the school prepares the extra education those children need; for children who need all types of extra care and also in specific for highly gifted children.

- Preparing the lessons per subject,
- make things for the lessons,
- preparing supportive education,
- preparing lessons for highly gifted children.

Operational processes:

Operational processes are the tasks in the primary process. Tasks that fit in with operational processes of SamSam are the teaching itself, the handing out of independent work, the analysis of the tests and the independent work of the children, and determining which child belongs to which educational sector. Taking tests is not by definition executive teaching work, nevertheless I defined it as an operational process. This is because the taking of tests is very much involved in the daily routine in the classroom that I have therefore defined it as an operational process. Hosting parent meetings is a task that is difficult to put in the right place. The task of hosting parent meetings fits between the operational processes of analyzing the children and determining to which educational level the children belong. I put it in the list of operational processes, this is because the teacher collects observations of a child and discusses them with someone who also knows something about that child. The teacher tests the analysis that he/she makes of the child with the parents. The correctness of the analysis is checked with another regulatory body. Therefore I chose to define hosting parent meetings as an operational process. When an individual child needs extra care this is done by the teacher within the class, this is different when more individuals are grouped together in order to provide this type of care (see supporting processes).

- Teaching lessons by subject,
- handing out independent work,

- analyze results of tests and the independent work of the children,,
- determining which child belongs to which educational level per subject.
- taking tests,
- host parent meetings,
- providing extra care for children who are need for this (e.g. children with dyslexia)

Supporting processes:

Supporting processes are processes that support the whole primary process, therefore if an individual child needs extra care for a specific subject this is part of the operational processes. Within SamSam there is a class composed of highly gifted children. Because these individuals are placed in a group and taken out of the classroom to participate in a specific lesson for highly gifted children, this is no longer part of the operational processes. This is a supporting process carried out by the IB'er. In the same way, extra language support for children from another country has been organized, and therefore put here as a supporting process. The IB'er also coaches and supervises starting teachers and trainees, this are all supporting tasks. It is not executive teaching work, but it helps to keep the primary process running smoothly. These tasks can be seen as HR support, where performance interviews are also part of.

SamSam is located within a school building in Oosterhout, Gelderland. The maintenance of the building is a supporting process because the building is needed in order to give lessons, but is not part of the primary process. The same goes for the google learning environment, audiovisual material management, outdoor storage management, making timetables, children administration, PR, intranet page, contact external agencies, all are needed in order to give lessons but are not part of the primary process of teaching. In order to give lessons the school should be a safe place, 'EHBO' and the annual update of the evacuation plan are therefore also part of the supporting processes.

- HR support (coaching and supervision of starting teachers and supervising trainees, performance interviews),
- Teaching and supervision of highly gifted children,
- extra language support for children from another country,
- Building maintenance,
- google learning environment apps for education,
- audiovisual material management,

- outdoor storage management,
- making timetables.
- children administration
- PR
- intranet page that informs the team and can inform each other about current affairs,
- contact external relations/agencies,
- ‘EHBO’,
- annual update of evacuation plan,

Appendix 5

Preparatory, implementing and supporting human activities

1. To identify all the preparatory, implementing and supporting human activities that are necessary in their mutual coherence as a result of the process design. These are the activities to be carried out by people (using the chosen technical means) and thus to be distributed among people (Kuipers et al., 2012, p.295).
    1. Underlying the teaching are the methods per subject. These methods are evaluated in the team meetings. When a problem is identified in such a team meeting, a working group is set up with volunteers to deal with this problem.
    2. A schedule has to be made, this is done by the *bouwcoördinatoren*.
    3. There are also other activities that take place throughout the year, such a Christmas celebrations, *schoolboekenweek*, etc. Hours are made available for each teacher. Various committees and festivities are organized with these hours.
    4. *Bouwvergaderingen* are held to discuss what is going on per *bouw (onderbouw en bovenbouw)*; problems, things that are going well, etc.
    5. There is a group meeting twice a year and every year there are children meetings (between teacher and IB-er), these are held when necessary, so not fixed moments.
    6. Every teacher has hours for professionalization, each teacher gets the opportunity to apply his/her specialism within the school, for this are study days buy also courses that individuals can follow.
    7. In addition to the assessment of the children on the different subjects, teachers also have to monitor and analyze the socio-emotional development of the children.

In the current situation teachers are linked to all subjects, they have to prepare the lesson for different care needs and then asses the method together with other teachers where they do not prepare the lesson with. It could be simpler to have a teacher specialize in a particular subject department that includes multiple relatable subjects. That subject department also then discusses which method should be used. The timetable would then no longer have to be made for each group individually, but could be made for the *bovenbouw* as a whole. One department is appointed as a mentoring group for the children, zo that they also bear responsibility for the development of the children within that group and the social-emotional development of its children.

Appendix 6

Addition to the new design for the situation that the school will grow in the future (meso-level recommendation)

As the school grows, SamSam's team will have to grow along with it. This can lead to exceeding the maximum team size of 20 members. Macro units Smaller than 200 organizational members, but larger than 20 are too big to act as one team based on direct, mutual coordination between all team members. This requires a second step. The meso design of the production structure is aimed at forming relatively independent task segments (group tasks) that you can assign to a team of preferably between 6 and 12 people but in any case less than 20 (Kuipers et al., 2012, p.323).

The way in which this can be achieved is through the formation of completed group tasks for which independent working groups are responsible. Independent means that such groups also carry out preparatory and supporting tasks (Kuipers et al., 2012, p.323).

One of the options is to create parallel teams. This means that the design as it stands now remains the same but that an extra bovenbouw team is added. That bovenbouw team is subdivided into subgroups in the same way as it is now in the current new design. The disadvantage of this option is; who decides which method should be used for which subject? Team 1 and team 2 cannot both be completely independent. As a school it would be crazy for children in the bovenbouw to be taught in a completely different way. Through project groups you could also determine which method is used for a certain subject, but not everyone can participate in a project group given the maximum number for a group to work well together. This way you still take independence out of a team.

Another option is to split the bovenbouw into two segments again. As can be seen in the new design, a macro segment is now divided into six educational levels. Splitting the segment would mean that one segment is responsible for educational levels one, two and three, and the other segment is responsible for educational levels four, five and six. Splitting up into new segments requires coordination between the segments, you create interfaces by doing this. However, the team of a segment can determine the method of teaching and remains much more independent than would be possible in this case with a parallel team. Also, in the first segment of the bovenbouw there will be no subgroup English, as English gets taught from the fourth educational level on.

As indicated, in this thesis I elaborate on one segment (the bovenbouw) because the principle is the same for the other segment (the onderbouw). Splitting a macrosegment into two segments thus creates four different segments. In the example schools they used three segments. So why is four segments still better than three segments? This is due to the difference in subjects that are offered in the onderbouw and bovenbouw, To create three segments you have to mix these subjects which will lead to a very difficult middle segment in which teachers have to participate in many more subgroups. This

is a choice I explained earlier. Now, as the school grows, changing from two to three segments would not be a smooth transition either. Splitting the current segments into two new ones would give a much smoother transition.

At the moment, the IB'ers take care of the smooth transition from segment to segment. I would like to keep this principle the same. For this reason:

Provided that the defunctionalization and decentralization up to task group level are carried out consistently, this can lead to a drastic increase in productivity (Kuipers et al., 2012, p.323).

Each segment has two teaching assistants and one administrative assistant, the division of work remains the same only they are responsible for a smaller part of the primary process, but still of a larger part than they were before in the old design. By keeping the teaching assistants and administrative assistant within the team, the preparatory and supporting tasks are all in the team and therefore they can work independently.

Appendix 7

Subject areas

1.	*Dutch Language*	*Linguistics*	*4*
		Writing	*(1/0,75/0,25/0,25)*
		Spelling	*4*
		Reading comprehension	*1*
		Technical reading	*2*
		Total	*11,5*
2.	*Creative*	*Music*	*0,4*
		Drama	*0,25*
		Drawing	*1*
		Handicraft	*1*
		Total	*2,65*
3.	*World Orientation (WO)*	*Geography*	*1*
		History	*1*
		Nature	*1*
		School TV/WO	*0,50*
		Total	*3,5*
4.	*Arithmetic*	*Math*	*4,5*
		Total	*4,5*
5.	*SED*	*SED*	*0,75*
		Total	*0,75*
6.	*LO*	*Zintuigelijke en lichamelijk opvoeding*	*1,75*
		Total	*1,75*
7.	*English*	*English*	*0,50*
		Total	*0,50*

Appendix 8

Distribution of teachers by subject area into subgroups

	Dutch	SED	Creative	WO	Arithmetic	LO	English
Teacher 1	x	x	x	x			
Teacher 2	x	x	x	x			
Teacher 3	x	x	x	x			x
Teacher 4	x	x	x	x			x
Teacher 5	x	x	x	x			x
Teacher 6	x	x	x	x			x
Teacher 7	x	x			x	x	
Teacher 8	x	x			x	x	
Teacher 9	x	x			x	x	
Teacher 10	x	x			x	x	
Teacher 11	x	x			x	x	
Teacher 12	x	x			x	x	

	Dutch	SED	Creative	WO	Arithmetic	LO	English	Total
Teacher 1	11,5	0,75	2,65	3,5				18,4
Teacher 2	11,5	0,75	2,65	3,5				18,4
Teacher 3	11,5	0,75	2,65	3,5			0,5	18,9
Teacher 4	11,5	0,75	2,65	3,5			0,5	18,9
Teacher 5	11,5	0,75	2,65	3,5			0,5	18,9
Teacher 6	11,5	0,75	2,65	3,5			0,5	18,9
Teacher 7	11,5	0,75			4,5	1,75		18,5
Teacher 8	11,5	0,75			4,5	1,75		18,5
Teacher 9	11,5	0,75			4,5	1,75		18,5
Teacher 10	11,5	0,75			4,5	1,75		18,5
Teacher 11	11,5	0,75			4,5	1,75		18,5
Teacher 12	11,5	0,75			4,5	1,75		18,5

Teacher 1 and 2 have a double role (so they are teacher but also IB-er or bouwcoördinator), therefore they have the least number of hours in this distribution. Everyone is a mentor for a group together with another employee. This is because that is the most amount of hours per week, and so each employee is involved in the whole process of a fixed number of children.

The other disciplines are thus divided on the basis of hours. In principle, everyone has two other disciplines in addition to Dutch Language as a subjectgroup. The two other disciplines in which you are also a specialist, you are with the same group of people. Because English is not taught during the entire segment, it is divided over 4 teachers.

As in the current formation, almost everyone comes to at least 18.4 lessons per week (in their appointment), this is except for some, most have more than this. For the teachers who have just a little less hours this will have to be divided in a correct way with the person with whom they teach Dutch Language together.

Appendix 9

Overview of supporting tasks

Supporting tasks	Teaching assistant 1	Teaching assistant 2	Administrative worker	TSO	Concierge	Teacher	IB'er	BC	Headmaster
Checking independent work of children	Nederlands N1 t/m N3 Rekenen Engels	Nederlands N4 t/m N6 WO Creatief							
Support by analysing results of independent work of children	Nederlands N1 t/m N3 Rekenen Engels	Nederlands N4 t/m N6 WO Creatief							
Checking tests	Nederlands N1 t/m N3 Rekenen Engels	Nederlands N4 t/m N6 WO Creatief				LO			
Import results of tests and IW	Nederlands N1 t/m N3 Rekenen Engels	Nederlands N4 t/m N6 WO Creatief				LO			
Maintenance building								x	
Counselling extra care							x		
Counseling starting teacher									x

Supervise interns						x	x		
Performance reviews									x
Contact external relations									x
Making timetables								x	
Overblijven				x					
BHV/EHBO					x				
Evacuation plan								x	
Google Learning Environment								x	
Audiovisual material management								x	
Head Lice Coordinator								x	
Intranetpage			x						
PR									x
Outdoor storage managmenet								x	
Support use of special learning tools							x		
Making reports						X			
Mail processing						X			
Financial completion of orders			X						
Processing enrolment of children			x						