



UNDERSTANDING, DEFINING AND MEASURING EDUCATIONAL QUALITY AND SUSTAINABILITY IN BASIC EDUCATION – THE CASE OF GOTLAND, SWEDEN

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Abstract

How educational quality and sustainability should be understood, defined and measured could be discussed. One important ingredient in both school quality and sustainability is that pupils achieve the minimum requirements of receiving a passing grade. Common problems for varying performance are such as privatisation of schools and many pupils that have recently immigrated. Public schools in Region Gotland have been studied. The percentage of immigrants in Gotland is well below that national average which makes it easier to identify others causes for poor performance and makes Gotland an interesting area for studies. Results show that in average only about 77% of the pupils in Gotland leave school in year 9 with a passed grade, which is close to the Swedish average of 74%.

This article presents the theme of sustainable school with a focus on the public schools of Gotland with associated school results during the years 2010-2020. Reasons for the varying and relatively low educational performance are discussed using a Gap Analysis. Some hypotheses for causes to poor performance are identified. Ideas for further research are presented, including such issues as size of the schools, teacher competence and principal competence.

Keywords

Sustainable school; successful school; successful principal; school quality; school sustainability

1. Introduction

A prerequisite in Sweden, and most countries today, for success in life is to have a good education. It could be a practical vocational education or a theoretical one. In Sweden it is generally the case that without having completed the nine-year compulsory school, the risk of being unemployed increases significantly. Secondary education in Sweden could be vocational training, but with theoretical parts included. Even the vocational education in most cases requires two or three years in addition to the compulsory 9-year school. Not having finished the mandatory nine years with a passing result makes completing the upper secondary school a challenge. Failing the 9-year compulsory school could therefore become a lifelong problem.

Sweden has a large proportion of immigrants and many of the school children attending some Swedish schools have had a poor educational start while also having poor Swedish language skills, things that most likely will affect school results. Another issue discussed extensively in Sweden is the division of private and state schools where substantial research has been carried out. Apart from these two possible reasons for differences in the school results there are many others that could explain the school performance. Common issues here are size of schools, teacher, and principal competence. These areas have not been studied here due to non-availability of data. These issues are only discussed as possible reasons and as a preparation for further research.

Region Gotland is the smallest out of the 21 regions in Sweden. As it also has a low percentage of immigrants and is an island makes it a good topic for a study. This article makes an attempt to find out how quality management could be used to support school sustainability, working with the principle of fact-based decisions. The research questions formulated are:

How could school sustainability be defined? What measures can be put in place and what are the causes for lack of sustainability?

2. Methods

School quality and sustainability have been studied based on a brief literature research combined with an analysis of the findings through the Quality Management lens of customer needs focus and by relating this to sustainability (Isaksson 2021). We use the five quality principles from Garvin (1984) to understand school quality and further school sustainability (Isaksson 2013). Based on the sequential logic of understanding, defining, measuring, communicating, and leading change (Isaksson & Hallencreutz 2008) we propose a definition for school sustainability. Focus on measuring sustainability performance has been on studying the percentage of passing grades, which is based on our proposed definition of school sustainability with a strong focus on school core performance.

We have chosen to study public schools in Gotland and the results of year nine, which marks the end of the mandatory nine-year school. By choosing Gotland and by choosing public schools we can avoid the politically sensitive issue of public and private schools. Also, since Gotland has a low percentage of immigrants, we can largely eliminate the issue of a high number of pupils that have immigrated recently, and which is often presented as one of the main causes for poor performance. This enables us to study the results when two frequently debated factors are not having an impact. We present the average school results for Sweden and those for public schools year nine in Gotland during the period of 2010 to 2020. The results are analysed quantitatively to detect trends and differences with national performance and within the Gotland schools. Reasons for the gap between 100% passing and the current performance are discussed using the GAP-model based on Zeithaml et al. (1990). The authors presented 1990 a model that was intended to explain the causes of customer dissatisfaction. This work draws inspiration from the GAP-model and is used to explain the reasons why school systems

do not work optimally based on sustainable principles. Below the five gaps from the model are translated to the school context.

- GAP 1 - Students' expected education and pedagogy offer and the school's perception of what is to be offered.
- GAP 2 - The school's perception of students' expectations of the designed offer.
- GAP 3 - Between the designed educational performance offer and the actually executed education offer.
- GAP 4 – Between the educational performance and what has been presented in advance for the pupils (created expectations related to communication and marketing).
- GAP 5 – Between student expectations and what was delivered. Here all GAP 1 - 4 are summarised. shown through what the students have received in relation to what was in the students' expectations.

We also have carried out a regression analysis for the average performance and for the highest and lowest performing schools to see if there are significant differences in performance. In addition, we wanted to correlate performance with teacher competence (if they are registered or not) the size of schools and the principal's education. However, data were only partially available.

3. Results and Discussion

The results are divided into a review of what school quality and sustainability could be. This review leads to an operational definition of school sustainability. An important measurable parameter that describes parts of school sustainability is the percentage of pupils passing exams to qualify for the next stage, which here is the upper secondary school. Results for the 9-year performance in Sweden and in Gotland are presented and discussed. An analysis of causes for the performance carried out with the Gap Analysis for the seven studied schools is presented. Finally possible solutions are discussed as part of a review of future research.

3.1. Discussing School Quality

There are several different goals that the Swedish school is subject to follow. Below, everything from the UN's goals to the school law and the curriculum for the Swedish school are presented. Below are some of the most central and overarching goals that are relevant in this article.

Article 4 of the UN's New Agenda states that education is a human right (UNDP 2021). Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

A report from the Swedish Schools Inspectorate provides a picture of what is significant for successful principals: The principal is committed, the decisions are based on analysing the connection between teaching patterns and the development of knowledge results, democratic and involving employees, creates a culture that fosters commitment and encourages skills development (Skolinspektionen 2019).

Quality goals can be found in Sweden's Education Act (SFS 2010:800) Chapter 3, section 2. The act states that "All children and pupils in all school forms and in the after-school centre shall be given the guidance and stimulus they need in their learning and personal development so that they can be developed as far as possible based on their own goals according to the educational goals". This needs to be ensured by developing activities that is consistent with

national goals and could be activities such as testing, following up and evaluating results. It also requires the development and testing of new methods.

Another important part of ensuring that all pupils can reach their full potential in both their learning and personal development is the interaction between school staff and pupils. In the Swedish National Agency for Education's regulation on sustainable school and sustainable learning (SKOLFS 2004:20) the ministry-initiated work to support preschools and schools in sustainable schools. The definitions of sustainable school were described at an early stage and that work is still ongoing. Among other things, a sustainable school must meet the following criteria in two overall areas:

A. Pedagogical management - all children, students and staff must be involved in the work for sustainable development, routines must be in place for how new staff are introduced in the work, staff must receive competence development, the business informs and involves other actors about the work with sustainability and the business evaluates the work annually with feedback to the management.

B. Pedagogical work - children, students and staff participate jointly in the ongoing work on sustainability and emphasis is placed on children and students having a real influence over the processes. (SKOLFS 2009:19).

In the Swedish Education Act (SFS 2010:800), it is stipulated in a separate chapter, Chapter 4: Quality and Influence, how the school should work with quality and quality assurance. The chapter contains provisions on Systematic Quality Work and Influence and Consultation. The provisions regarding Systematic Quality Work describes tasks on three different strategic levels, i.e., National level, Principal level, and Unit level. On National level there are provisions on supervision, state quality review and national follow-up of the school system and other educations. On principal level there are provisions that every principal in the school system shall systematically and continuously plan, follow up and develop the education. Lastly, the provisions on Unit level are that such planning, follow-up and development of the education as specified on principal level shall also be carried out at preschool and school unit level. Although, it is the principal's responsibility that the quality work at unit level must be carried out with the participation of teachers, preschool teachers, other staff and students. Children in preschool, their guardians and the students' guardians must be given the opportunity to participate in the work.

The focus of the Systematic Quality Work, according to the tasks on the three different strategic levels abovementioned, shall be that the goals that exist for education in this Act and in other similar regulations (national goals) are met. The Systematic Quality work shall be documented, and it is the principal's responsibility to ensure that the work functions properly at each school. The principal of a more successful school is a so-called "*goal advocate*" and can also implement and execute own ideas at his school based on Blossing's research (Jarl, et al. 2017). This approach requires clear communication at school.

Several reports indicate that successful schools have collaborative systems between building collaborative cultures and creating structures that support this culture and productive working relationships between all parties at the school (Höög and Johansson, 2014: 51). A research group has expanded the concepts of structure and culture in a study and concluded that to be a successful school, a strong culture and structure is required (ibid: 52).

Professor Berg, who also specializes in school culture, believes that school development is based on the school's own needs and conditions to develop the school's human material resources for the benefit of the students (Berg, 2003: 65). Höög and Johansson (2014:54) emphasize the importance of a democratic leadership to build a successful school. Through a clear and democratic leadership that focuses on both structure and culture, good communication and dialogues could be ensured.

Sustainability can be understood from several different angles. Let's start by trying to understand what characterizes a successful school. It should be mentioned that it is these parameters in their coherent form that constitute a more successful school. A successful school works with a focus on teaching the basic knowledge where regular evaluations and differentiated knowledge checks are parts of the everyday work, (Grosin, 2003).

The school's culture consists of a distinct collaborative culture between teachers and between teachers and school management. Teaching is improved and developed with different kinds of pedagogically differentiated teaching methods where there is a high positive expectation of the students' positive knowledge development. The school culture consists of the social regulations being common to everyone at school and the school's work environment consists of order. The school also develops strategies for good cooperation and collaboration with guardians, a development Grosin (2003: 162) calls the "*Home curriculum*".

The principal's role in the successful schools is important for the school's development. A principal at a successful school is constantly developing the pedagogical and didactic methods in harmony with the teachers in order to improve school results where the teacher is the specialist of the classroom. The more successful principal also protects the school's internal work against external pressure and improper demands from outside (Grosin, 2003: 162). The principal distributes resources with a focus on school-improving measures. Finally, it turns out that a successful principal is visible at the school, both socially, pedagogically and didactically and has a high personal profile that is characterized by clear leadership where the principal is also part of other groups with other similar principals. Decisions are made in agreement with the teachers according to the principle of bottom-up (ibid.: 137).

In the State's public investigation of professor Johansson at Umeå University, a complexity emerges with the double chains of power for the individual principals of the school units in Sweden. These double chains of power have an aggravating effect for the individual school leader to be able to develop his or her school to meet the criteria for a more successful school (SOU 2015: 22).

In the research project "*Structure, culture, leadership - prerequisites for successful schools*", in which 24 principals participated, a picture emerges about these principals' prerequisites for carrying out their assignments. In Höög's chapter Successful schools - more about structure, culture, leadership, it appears that it is difficult for the principals to be able to assess whether the work organization is appropriately designed. Höög describes the school management's problems with the strong individuality of the professionals, at the same time as the structure must be strong as the requirement for documentation and accountability is constantly increasing. The question therefore arises - what analysis tools do the principal have to keep control over which processes actually take place at the school? Analysis of the structure and culture of the school can be the solution for a present principal to gain control and overview of the activities (Höög & Johansson 2014: 49).

Furthermore, there are a number of lessons to be learned from the Finnish school system. The Finnish teacher education provides a research-preparatory master's degree and there is a high application pressure for the Finnish teacher education, only just over 10% of the applicants are admitted to the education which requires high grades and also an approved interview. Finnish teachers have a high status and the longer a teacher has worked, the higher the salary.

Sahlberg (2012) describes that Finnish teachers have what the Finnish educator Matti Koskeniemi calls pedagogical love. The Finnish teachers perform their moral task and all tasks that are linked to the school's primary task - to educate and educate the students. There is an extremely limited state inspection in Finland. All quality work is performed at the local school. The state school inspectorate is in principle abolished with Sweden has increased the resources for the state school inspectorate.

In Finland, there is no compulsory schooling as in Sweden, but instead there is a compulsory education, which means that the municipal school is voluntary but that the pupil has an obligation to learn in school. The school's teaching is differentiated, and the students are tested as soon as they start school so that the school can quickly deploy the support resources required. The Finnish school has fewer teaching lessons, they have fewer exams, and they have a higher equality in their school system than many other countries. The school also has a voluntary tenth school year so that all students can reach the knowledge goals.

There are different voices about what quality in school really is. After consulting Professor Gunnar Berg on the issue of quality, he believes that the term is almost impossible to use in the school context. Some articles say that it is safe socialized children that mean school quality, while others think that school results, ie high grades, are central to good quality in school.

There is a community around criticism of quality as a quantitatively fed concept among the researchers reported in Bergh's dissertation (Bergh, et al., 2010). No matter how we look at Swedish schools, quality in schools is a controversial and unclear concept to apply when a uniform definition is lacking.

After reading various suggestions for definitions the one presented by associate professor Lennart Grosin at Stockholm University could be of help: "*The primary utility of the school is to educate and socialize the children*".

3.2. Discussing School Sustainability

The National Agency for Education's leaflet on the description of the criteria for sustainable development is supported by the Brundtland Report from 1987, which is also dealt with in the Swedish government official report 2004:104, where sustainable development is defined "*as a development that satisfies current needs without jeopardizing future generations' ability to satisfy their needs*". Furthermore, it is believed that sustainable development in the field of education needs to be refined, clarified, and become comprehensible in education (SOU 2004:104).

In the search for sustainability in schools, we have looked for certain keywords in databases that are linked to school research and sustainability research. After choosing a selection of articles, a picture emerges that the vast majority of researchers and writers believe that the school's sustainability is mainly about teaching students about sustainable cycles based on environmental aspects and teaching in the field of sustainability. It can perhaps therefore be understood that sustainability is mainly about subject didactic issues within the teaching itself, which is addressed in *Creating Change for People and Planet: Education for Sustainability Approaches and Strategies* by (Davis 2013).

Sustainable school leadership as presented by Hargreaves (2010) also appears in his article *Sustainable Educational Reform* which means that sustainability is about not impoverishing people and the system. In Hargreaves' own words: "*Sustainability means more than maintainability. It means developing changes that matter, spread, and last and do no harm to others*", (Hargreaves, 2010:293).

Another aspect of sustainable schooling is the importance of positive cultural learning environments, which is in line with research on successful schools. The importance of positive high expectation of students learning outcomes, strong teaching community, trust and respect, reflective conversations, organizational learning and decentralized autonomous teaching communities, these cultural expressions have a direct effect on students' positive learning outcomes (Lee and Louis, 2019).

Furthermore, good examples are rewarded for both students and teachers, while quick sanctions are handed out in the event of border crossings from the social rules. In successful schools, the school culture consists of positive rewards where teachers and school management

are positive role models and authorities. At the same time, these schools are also focused on adapting to the individual student's needs and conditions (Jarl et al., 2017: 87).

Sustainable leadership and sustainable improvement as something that preserves and develops in-depth learning that does not harm but gives positive results for others now and in the future (Hargreaves and Fink, 2008: 26).

Hargreaves and Fink (ibid.: 27) point out seven principles for sustainable leadership in the school:

- Principle 1. Depth - the school must preserve, protect and promote what enriches life, apply broad and deep learning.
- Principle 2. Length - even if there is a change of leadership, sustainable leadership remains from one leader to the next.
- Principle 3. Width - sustainable leadership is distributed leadership and is dependent on the leadership of others.
- Principle 4. Justice - sustainable leadership actively improves the surrounding environment.
- Principle 5. Diversity - sustainable leadership promotes cohesive diversity, a strong biodiversity.
- Principle 6. Wealth of resources - sustainable leadership develops material and human resources.
- Principle 7. Preservation - sustainable leadership preserves the old and builds on the past in its quest to create a better future.

In summary, we can state that a sustainable school has a strong management, a good culture of cooperation where all parties are involved with reward systems and positive expectations and focus on the mission with continuous improvements and method development. The school's primary task is to educate and educate students based on current governing documents. But how does the school's primary mission in the activities work? Furthermore, it is believed that sustainable development in the field of education needs to be refined, clarified, and become comprehensible in education (SOU 2004:104).

3.3. School Sustainability with a Starting Point in Quality Management

Can sustainability be understood in the light of a Quality Management principles? To lead sustainable change in schools we need to be able to communicate what it is, which requires that we can measure it, which means we need a definition which we can produce when we have a common understanding of school sustainability. Based on the literature review in section 3.1 and 3.2 the indication is that there is no clear understanding of neither quality nor sustainability. This means that we are at the very beginning where we need to create a common understanding and definition. Based on this definition we then can propose how to assess performance. How could school quality and sustainability be defined based on the most important stakeholder needs? What characterizes school quality and sustainability, and could we create a common understanding for this? We have used core quality principles to present our simplified view of school quality and sustainability.

We can analyse both quality and sustainability based on Garvin's five perspectives (Garvin, 1984). Transcendent quality is in the eye of the beholder, but in this context this perspective does not seem relevant and is not further discussed.

Production-based (we follow rules regulations) - highly relevant in all respects.

Product-based (we have competent and licensed staff) relevant.

User-based (The "customers" - students, parents, high school, society decide what constitutes quality) - relevant

Value-based - what do we get for our money (performance compared to resource use).

The Swedish Schools Inspectorate is a state authority that has supervisory responsibility for all of Sweden's schools in all its various school forms. They carry out Quality Control to check that rule and regulations are followed (production-based perspective). In the regular inspections, the Swedish Schools Inspectorate is based on four quality areas:

- Principal's leadership
- Teaching
- Security and study peace
- Assessment and grading

Thematic quality reviews are also carried out and an example of a thematic review is about how the schools work with learning for sustainable development, which results in a feedback report to the individual school. This does however not clarify what school quality is, apart from following different rules and regulations.

From a user perspective with focus on the pupil, quality could be seen as achieving the levels required for an entry to the next stage. Similarly a sustainable school provides the required value for pupils while minimising footprints both social and environmental. Here, we study the grade 9 school process with start from pupils entering from 8th grade and a stop when pupils have finished 9th grade. The value produced in the educational process is learning with the purpose of being able to continue learning in a next stage. All grade 9 pupils are supposed to continue learning, either as vocational training or as learning in a traditional secondary school. Pupils from 9th grade are 16 years old and in Sweden there is practically no work to be found before turning 18, which means that continued schooling is the only feasible option. Based on this it could be argued that the main value generated in the year 9 learning process is a passing degree. This can be seen as the single most important output from the process. In parallel, there are other important outputs that need to be considered such as the cost of the education, to what extent the content prepares pupils with the competence needed, how teachers experience their working situation, how parents view the learning and how pupils are treated in school. Applying the sequence of understanding, defining and measuring a process for teaching grade 9 leads to the conclusions:

- Quality and sustainability in the educational process are about generating maximal learning value where all pupils learn as much as they can but at least to a level of leaving year 9 with a passing grade
- Leaving school with at least a passing grade after 9th grade is defined as core both for school quality and sustainability
- We measure the quality and sustainability of the process as the percentage passing and set the target of 100% passing

With this logic as a starting point, we can diagnose the potential for improvement as the difference between the target and actual performance. The work then continues by analysing the causes for not reaching the target and further in to seeking solutions.

3.4. School Performances in Sweden and on Gotland

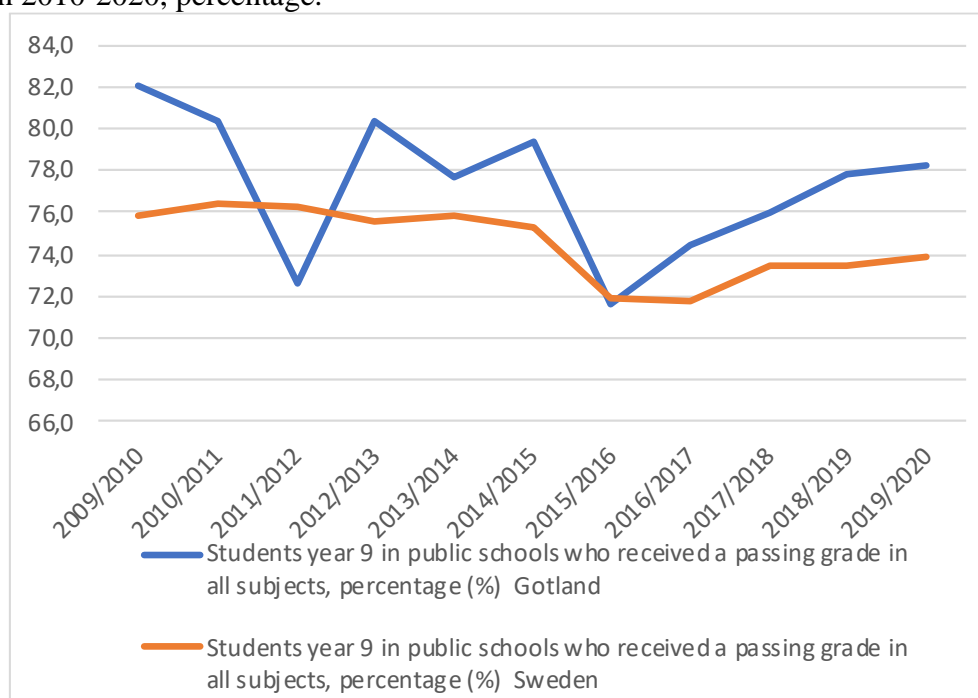
We study the performance using available statistical data with the purpose of identifying the gap between the target of 100% passing and the current performance. This could be seen as the process of diagnosing quality and sustainability performance (Isaksson 2015). In table 1 and figure 1 we can see that results are at the level of 70-80% passing.

Table 1. Students year 9, who received a passing grade in all subjects, public schools Gotland, percentage.

| Year | Färösundsskolan | Högbyskolan | Klinteskolan | Romaskolan | Solbergaskolan | Solklintsskolan | Södervärnsskolan | Annual average Gotland |
|------|-----------------|-------------|--------------|------------|----------------|-----------------|------------------|------------------------|
| 2010 | 77.1 | 76.2 | 82.4 | 75.0 | 92.8 | 67.6 | 80.9 | 82.0 |
| 2011 | 81.6 | 84.4 | 79.5 | 71.0 | 81.4 | 84.1 | 79.6 | 80.4 |
| 2012 | 85.7 | 71.0 | 47.2 | 65.5 | 78.7 | 80.0 | 69.3 | 72.6 |
| 2013 | 89.3 | 75.8 | 73.2 | 85.4 | 80.4 | 75.0 | 82.4 | 80.4 |
| 2014 | | 84.0 | 82.8 | 65.8 | 81.2 | 63.6 | 84.2 | 77.7 |
| 2015 | 91.7 | 82.1 | 75.8 | 68.2 | 75.4 | 81.0 | 86.1 | 79.3 |
| 2016 | 70.0 | 79.5 | 59.0 | 96.1 | 84.7 | 85.2 | 86.4 | 71.6 |
| 2017 | 59.4 | 66.7 | 57.5 | 87.2 | 82.4 | 70.5 | 73.9 | 74.5 |
| 2018 | 54.1 | 78.3 | 51.2 | 95.1 | 83.8 | 67.5 | 74.1 | 76.0 |
| 2019 | 73.3 | 67.7 | 61.3 | 87.9 | 80.9 | 65.6 | 81.0 | 77.8 |
| 2020 | | 85.2 | 79.2 | 80.6 | 76.3 | 95.3 | 71.3 | 78.3 |

Source: The Swedish National Agency for Education 2021.

Figure 1. Students year 9, in public schools who received a passing grade, Gotland compared to Sweden 2010-2020, percentage.

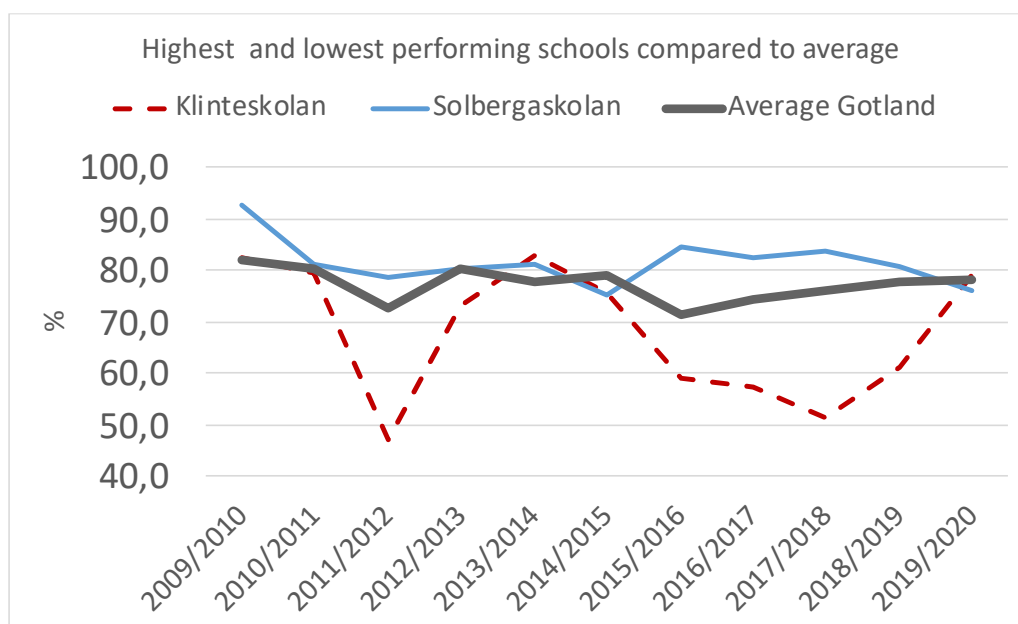


Source: The Swedish National Agency for Education 2021.

Results in Figure 1 indicate that the Gotland public school performance is slightly higher than the Swedish average. However, the overall results are far from the target of 100% and furthermore we cannot see any positive trend towards the goal. There are some differences between the highest and lowest performing schools, see Figure 2.

The Gotland public schools have a clear improvement potential increasing the current average performance of about 77% in the period to 100%. The improvement potential is lifting performance with 23% units. The Gotland public schools have at times an extremely low proportion of licensed teachers. Urban schools tend to have a higher proportion of licensed teachers than rural schools.

Figure 2. Students year 9 in public schools who received a passing grade, average, lowest and highest performing public school on Gotland 2010-2020.



Source: The Swedish National Agency for Education 2021.

Table 2. Proportion of teachers (full-time positions) with a teacher ID with eligibility in at least one subject in compulsory school grades 1-9, public schools Gotland, percentage.

| | 2014/ 2015 | 2015/ 2016 | 2016/ 2017 | 2017/ 2018 | 2018/ 2019 | 2019/ 2020 | Av.per school unit |
|------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------------------|
| Färösundsskolan | 82.0 | 60.3 | 52.0 | 49.8 | 46.1 | 53.7 | 57.3 |
| Högbyskolan | 74.0 | 77.9 | 62.6 | 60.3 | 60.5 | 68.4 | 67.3 |
| Klinteskolan | 69.0 | 70.7 | 72.2 | 68.4 | 62.2 | 59.2 | 66.9 |
| Romaskolan | 70.0 | 75.2 | 69.2 | 60.0 | 80.5 | 62.5 | 69.6 |
| Solbergaskolan | 70.6 | 83.2 | 80.1 | 88.0 | 84.4 | 80.5 | 81.1 |
| Solklintsskolan | 45.3 | 63.7 | 44.7 | 48.0 | 40.9 | 44.9 | 47.9 |
| Södervärnsskolan | 66.7 | 88.9 | 87.4 | 74.7 | 76.5 | 76.6 | 78.5 |
| Average per year | 68.2 | 74.3 | 66.9 | 64.2 | 64.4 | 63.7 | |

Source: The Swedish National Agency for Education 2021.

3.5. Analysing Causes for Performance using the GAP model and Regression Analyses

There was not enough data to make any meaningful correlation between school performance and teachers with legitimation. The poorest performing school has an average level of teachers with legitimations. Solberga, the school with the highest performance has also the highest level of teachers with legitimations.

3.5.1 GAP Analysis

In this example, two models are discussed - the GAP model and the Cornerstone model. We only briefly touch on the model for structure and culture that both of the above-mentioned models touch on. We start by going through the GAP model.

- GAP 1 - Lack of communication and too many different management levels in the school can explain disruptions in GAP. Lack of communication and too many different management levels in the school can explain disruptions in GAP 1.
- GAP 2 - The school's perception of students' expectations the designed offer. Lack of insight on the part of management, shortcomings in the production development process and inadequate goal formulations can explain disruptions in GAP 2.
- GAP 3 - Between the designed offer the actually executed offer. Unclear division of roles, conflict between different roles, lack of competence, inappropriate management principles and lack of cooperation can explain disruptions in GAP 3.
- GAP 4 - The offer made is what is promised to the students. Poor internal communication and unrealistic promises can explain disruptions in GAP 4.
- GAP 5 - In this context, the offer applies to a minimum grade of E in all subjects at the end of year 9, which is the absolute lowest requirement that students and their guardians can request from the school.

3.5.2 Quantitative Analyses

Results in Figure 1 indicate that the Gotland public school performance is slightly higher (77% passing) than the Swedish average (74% passing). However, the overall results are far from the target of 100% and furthermore we cannot see any positive trend towards the goal. There are some differences between the highest and lowest performing schools, see Figure 2.

We also have carried out an analysis for the average performance and for the highest and lowest performing schools looking at teacher competence, size of schools. The difference between the highest and lowest performing school is significant at 5% level. Also, the difference between the lowest performing school and the average is significant whereas the difference between the highest performing school and the average only is indicative, but not statistically significant.

3.6. Discussing solutions

Based on the performance results and the diagnosed potential as well as analysing the main causes we discuss solutions for the Gotland school. When diagnosing the year 9 performance in Gotland a substantial gap between 100% passing and the actual situation is found. Public schools in Gotland only have about 77% passing.

What have we seen so far regarding the proportion of eligible students in year 9 at the municipal Gotland schools during the period 2010-2020? We begin by stating that the students' school results need to be improved in certain schools. Based on GAP 3, we see a clear conflict between what is to be offered and what is actually delivered. Klinteskolan on southern Gotland deviates to such an extent that further investigations need to be appointed. From Garvin's perspective, the school must follow the regulations and be legitimate and relevant to the students. Compare with the years 2011/2012, 2015/2016, 2016/2017, 2017/2018 and 2018/2019. It would also be interesting to study the development of events at the school last school year when the school raised its school results to 85.2, which is above the national average. This requires in-depth studies at the local school unit. There is no clear connection between the proportion of certified teachers and school results, for example Klinteskolan which shows Gotland's worst result in relation to Fårösundsskolan and Solklintsskolan which has

slightly better school results but lower proportion of certified teachers than what Klinteskolan shows on average.

The UN's goals set the requirement that all children receive adequate schooling which has support in Swedish school law where it is stated that the students must reach their full potential. It is also stated in the governing documents that the students must be involved in the systematic quality work. Furthermore, it is important that the home curriculum is active in the improvement work so that the guardians really support the school work. Lessons from both research on successful schools and lessons from the Finnish school show the value of working student-centered with a differentiated teaching method with rapid support measures for those students who have special needs. How Gotland works with the systematized student health work is unclear.

There seems to be different voices about the correlation between the teacher's qualified formal qualifications and the students' actual study results. In the article *Teacher qualification matters: The association between cumulative teacher qualification and students' educational attainment* (Lee and Lee 2020), a positive correlation emerges between the teacher's education and the students' study results. In the material examined on Gotland, there is no clear correlation between the teacher's formal qualifications and the students' study results. However, the issue must be investigated more deeply on Gotland in order to be able to draw any further conclusions.

We also know that the principal's role for school success is central where the principal may need to act as a goal "goal advocate". The principles of sustainable leadership show that the principal's are crucial over time, but should not be strongly individualistic. Further studies need to be done around the Gotland principals and processes have begun to find out the principals' formal competence and number of years at the respective school.

Research on successful principals shows that principals allocate resources with a focus on school-improving measures. A sustainable principal bases his decisions on the organizational memory of the school and depletes neither personnel nor material values and resources. Biodiversity is valued at the school and the decisions are based on the business's real needs and reasonable requirements.

After examining the research on effective successful schools, the importance of a sustainable fact-based structure in relation to a favourable and positive school culture in harmony with appropriate structures is emphasized, which both Professor Berg and Professor Johansson teach us.

The success of the Finnish school is about an autonomous well-educated professionalism of the teachers with few external controllers but all the more internal self-controls. A successful school is led by a well-educated and professional teaching staff with strongly committed leadership by the principal. Sahlberg describes Koskenniemi's words that teachers in Finland love pedagogical love. Are the Gotland schools populated with teachers and principals who feel pedagogical love as there is sometimes a worryingly low proportion of teachers with teacher credentials?

What Gotland needs to take stock of is the degree of trained teachers, the level of education of the island's principals and the concentration on larger school units to strengthen that all schools on the island have qualified teachers. Gotland also needs to make various efforts for the schools that show serious shortcomings in the throughput of students who drop out of year 9. This requires sustainable leadership, perseverance, and strong management at all levels. In summary, we can state that a sustainable school has a strong management, a good culture of cooperation where all parties are involved with reward systems and positive expectations and focus on the mission with continuous improvements and method development.

How should schools be able to measure their sustainability? Every year, the schools on Gotland must write a quality report that the principal must receive from all schools. These

reports have been requested from Region Gotland, but unfortunately Region Gotland has not been able to find the reports in its archive.

Professor Johansson highlights the complications with the double power chains, where on the one hand the power chain from the principal and on the other hand the management chain locally at the school do not always have a consensus. (Höög and Johansson 2014).

In school quality and sustainability development, the importance of controlling and controlling the processes that prevail daily at the school is emphasized. A question in this context is how these quality reports are formulated and on the basis of which measurable indicators are the analyzes written? At the time of writing, this question is unanswered.

Different patterns emerge in the different schools and in order to gain an increased understanding of each school's challenges, ups and downs, in-depth work needs to be done.

In this forthcoming study, each school unit will be analyzed on the basis of the GAP model as well as on the basis of school culture and appropriate structures.

If we look specifically at Region Gotland's municipal schools' results for the students in, it would be interesting to do a screening of each school unit. Södervärnsskolan is particularly interesting during the years 2017-2018. The Education Act and the school curriculum provide directives that each student must achieve optimal learning based on their conditions. The curriculum states that the business must engage in continuous improvement with frequent evaluations and method development. The teaching must be structured. The UN's agenda 2030 goal states that education is "the key to prosperity". The National Agency for Education's project on a sustainable school emphasizes the importance of including all participating actors and the importance of evaluations. Sustainable leadership is presented as sustainable, equitable and conservative leadership.

4. Conclusions

The research questions formulated are how we could define school sustainability, how we could measure it and what the main causes for lack of sustainability are.

4.1 Defining school sustainability

We have concluded that any definition of school quality and sustainability must include a focus on pupils and their needs. Particularly for the mandatory 9-year education we propose the definition:

Leaving school with at least a passing grade after 9th grade is defined as core both for school quality and sustainability

4.2 Measuring school sustainability

Based on the definition we can establish quality and sustainability measurements based on the percentage having a passing grade after year 9. This could be seen as core performance, which then is related to a number of causes such as teacher competence, size of school, parents background, percentage of immigrants, school form as public or private etc.

4.3 Main causes for low performance

Here, we only have qualitatively covered some as those mentioned under 4.2. More specifically based on the review of schools in Gotland some issues have turned up. An interesting conclusion about our work is that the rural schools in Gotland generally show slightly worse results than the city schools do. The two schools that show the worst school performance have had a stable group of principals over time. This phenomenon needs to be investigated further. It would also be central to explore how the administration supports the schools and with which quality technical tools are applied in the governance models.

Let us also dwell on the variables that characterize a more successful school. What is interesting in this context is that both the structures for learning and teaching and a favourable positive school culture interact in the more successful schools. The school management interacts with the teachers and a positive expectation of all students' development and study results as well as the teachers' profession permeates the school.

Future research questions will therefore be:

- How has the school management interacted with its teachers at the affected schools?
- How does the systematic quality work based on the six parts of the Cornerstone model?
- How can the more problematic schools with extremely low study results be explained from the different perspectives of the GAP model?
- What happens to the students who do not reach the knowledge goals in year 9? What support do these students receive in the transition to upper secondary school? How many students graduate from high school with a university degree?
- How do school managements work to ensure that the processes in each classroom so that all teachers work with appropriate methods?
- What can Region Gotland learn from the success factors of the Finnish school system?

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